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TEACHER'S GUIDE TO OUTDOOR EDUCATION.

BY- RYAN, ARTHUR J.

UNION COUNTY OUTDOOR EDUCATION CENTER

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INCLUDED ARE (1) A DESCRIPTIVE BROCHURE, AND (2) A TEACHER'S GUIDE FOR THE UNION COUNTY OUTDOOR EDUCATION CENTER. THE PROGRAM CONSISTS OF A DAY CENTER, WHICH PROVIDES ONE- AND TWO-DAY SESSIONS OF AT LEAST FOUR HOURS DURATION FOR GRADE 5 STUDENTS FROM PUBLIC AND NON-PROFIT SCHOOLS IN UNION COUNTY. THE DESCRIPTIVE BROCHURE RELATES (1) THE LOCATION OF THE AREA, (2) THE HISTORY OF THE AREA, (3) A BRIEF DESCRIPTION OF THE FIELD ACTIVITIES USED IN WORKING WITH VARIOUS DISCIPLINES AND SUGGESTED OUTCOMES, (4) A CHECKLIST OF THE TREES AND BIRDS OF THE AREA, AND (5) A MAP OF THE AREA. THE TEACHER'S GUIDE DISCUSSES (1) A PROGRAM RATIONALE, (2) PROGRAM OBJECTIVES, (3) TEACHER PLANNING INCLUDING ADVANCED PREPARATION, CLASSROOM FOLLOWUP, GROUP CONTROL, AND HEALTH AND SAFETY SUGGESTIONS, AND (4) THE INTEGRATION OF OUTDOOR EDUCATION WITH THE SCHOOL CURRICULUM. A RESIDENT CAMP IS BEING DEVELOPED ON A SEPARATE LOCATION WHICH, WHEN ESTABLISHED, WILL CONCENTRATE ON GRADE 6 STUDENTS AND ALLOW THE DAY CAMP TO CONCENTRATE ON GRADE 5 STUDENTS. APPENDED ARE (1) COPIES OF THE DAILY SCHEDULE AND VARIOUS REQUIRED PERMISSION FORMS, (2) LISTINGS OF ACTIVITIES, (3) SUGGESTED CLASSROOM FOLLOW-UP ACTIVITIES, (4) SOURCES OF PERTINENT PUBLICATIONS, AND (5) AN ANNOTATED BIBLIOGRAPHY. (DS)

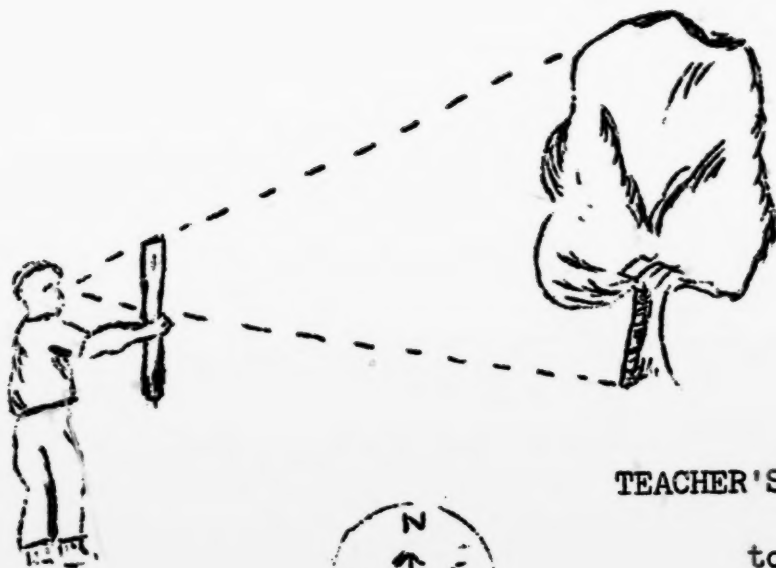
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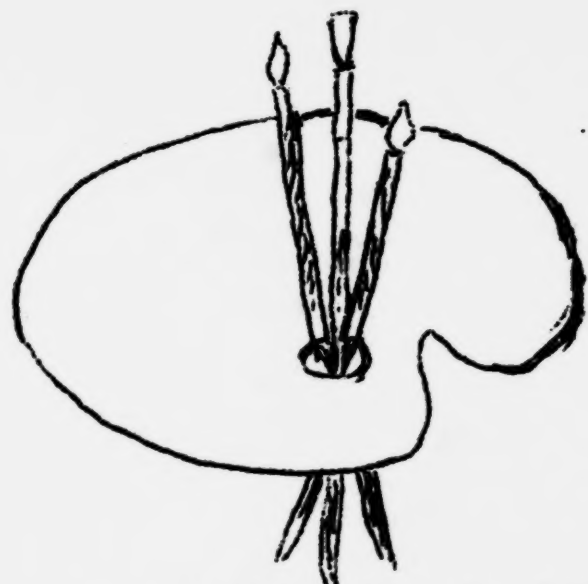
UNION COUNTY OUTDOOR EDUCATION CENTER



TEACHER'S GUIDE
to
OUTDOOR EDUCATION

I think
shall never
A poem as
as a

that I
see
lovely
tree.....



Design: James M. Kenny, Jr.

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UNION COUNTY OUTDOOR EDUCATION CENTER

2 Glenside Park

Berkeley Heights, New Jersey 07922

**Arthur J. Ryan
Director**

**TEACHER'S GUIDE
TO
OUTDOOR EDUCATION**

**U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION**

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Elementary and Secondary Education Act of 1965**

U. S. Department of Health, Education, and Welfare/Office of Education

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Poets of all times and places, most painters and sculptors, the majority of great writers, many abstract thinkers, the greatest scientists have avowed an intimate need of nature. In some of them the thirst for natural things, for the full sky, landscapes, trees, flowers, wild animals, the tang of the autumn wind, the tumbling seas and tranquil lakes, has been an obsession. They have truly fed upon nature in all of its aspects. The implication is clear that severed from nature, man's imagination and inquiring mind would diminish, perhaps wither utterly. -- Edgar Ansel Mowier, "Sawdust, Seaweed and Synthetics", Saturday Review, December 8, 1956

The Union County Outdoor Education Center, funded by the Federal Government under Title III of the Elementary and Secondary Education Act, Public Law 89-10, is administered by the Linden Board of Education, Linden, New Jersey. The Outdoor Education Center's program and facilities, however, are available to all school districts within Union County.

LOCATION OF THE UNION COUNTY OUTDOOR EDUCATION CENTER

The outdoor school is located in the Watchung Reservation, a 2,000 acre wooded park located in the Watchung Mountains. The Union County Park Commission has generously permitted the Union County Outdoor Education Center to locate its program in the Reservation.

Here there are trails once followed by the Indian, and sites where he once settled. There is an abundance of wildlife such as deer, flying squirrels, chipmunks, weasels, mink, muskrats, racoons, fox, ducks, and other waterfowl. There are hills, fields, lakes, brooks, woodlands, and a Natural History Museum and Trailside Nature Center. Most of the Reservation is being allowed to remain in a natural, undeveloped state.

The Outdoor Education Center is located in an area of the Watchung Reservation known as Glenside Park. Its more popular name, however, is Deserted Village.

The village is steeped in history. Brief fighting broke out here between scouting parties from the British and Washington forces. Grist, or flour mills, utilizing water power, served generations of settlers who lived here. The grist mills became powder mills during the war of 1812 and later became paper mills. A sizable village had grown up here during that time, and ten of the buildings are still standing today.

One of the buildings serves as the administration office and library for the Outdoor Education Center. Other buildings are used for a field science laboratory, nature center, arts and crafts room, and meeting rooms.

OUTDOOR EDUCATION STAFF

CHARLES HOLTZER

Former Director of the Union County Outdoor Education Center (September 1966-November 1967) who planned and developed the original program for the center and camp, served on the teaching faculty of New York University and was the Director of the New York University Conference Center and Camp. He also worked for various professional organizations related to the field of outdoor education, such as the National Audubon Society. In addition, Mr. Holtzer is the co-author of a book entitled, The Role of Outdoor Education, published by The Center for Applied Research in Education (Prentice-Hall).

ARTHUR J. RYAN

The present Director of the Union County Outdoor Education Center, is a certified teacher in Science in Secondary Schools. He has had a wide range of experiences related to the outdoors, including field work with the New York State Conservation Commission (exploring remote ponds and lakes to locate spawning beds of trout, clearing trails, tree cutting and fire fighting), Camping Director for Boy Scouts, Director of a summer camp, and Program Director of a Y.M.C.A. summer camp. He has hunted, fished, and camped extensively for many years, both summer and winter, in remote areas of the Adirondacks.

JAMES M. KENNY, JR.

Assistant Director of the Outdoor Education Center (December 1966 - July 1967) is presently on a leave of absence in order to participate in a graduate program on Outdoor Education. He earned his B.S. in Elementary Education from Wagner College. He has had general and science teaching experience in grades five through eight. He has served the scouting movement in scout and explorer programs on both advisory and institutional organization levels.

NATURE STUDY

The trees and the skies and the lanes and the brooks
Are more full of wonders than all of the books
And always outdoors you can find something new;
You never are lacking for something to do.
You never hurt others, or get in the road
In taking the pleasures by nature bestowed;
For there's room on the shore where the great tides roll,
And freedom and peace that are good for your soul;
There's hardly a way you can have so much fun
As in being out-doors with the brooks as they run,
With the birds as they fly, and the stars as they shine,
With the drift of the years as they rise and decline.
It doesn't cost much and it doesn't take long
To get your ear tuned to the mighty world's song.
It brings in its train no unpleasant regrets,
And the farther you go the better it gets.
So, come where the wild things are waiting outside
And let your soul taste of the joys that abide.

James G. Needham

AN INTRODUCTION
TO
OUTDOOR EDUCATION

THE OUTDOOR SCHOOL

"How large is your classroom?" "It covers 2,000 acres." "Where are the classroom walls?" "As far as the eye can see and beyond." "How high is the classroom ceiling?" "It is infinite." "Where are your desks and chairs?" "The land serves as our desks and chairs." "Where is your blackboard?" "Wherever one looks." "What textbooks do you use?" "The Book of Life and the Book of the Outdoors." "What other teaching tools do you use?" "We make use of the wild-life, the waters, the forests, the minerals and the soil." "What is your schedule for the various class periods?" "That depends upon what we may be doing at a particular time. We actually have no periods as such. Instead, we attempt to emulate life as it really is. That is, to show how all facets of living is interrelated.

In our outdoor school, no subject stands alone but rather, is fused, one with the other, to make a whole, just as the pieces of a puzzle are fitted together, one piece becoming indistinguishable from the other, to complete a picture. Although we teach language arts, science, arithmetic, social studies, music and art, they are taught together to perform a single function--to complete the picture of life as it really exists. Many students, consequently, are not fully aware, nor should they be, of when they are learning arithmetic, when they are learning social studies, and when they are learning science and language arts."

The teacher will find that an outdoor school offers a different kind of teaching and learning environment. Here the teacher and children will be able to free themselves from the physical limits imposed by the formal classroom and become involved in real life experiences. The student will be able to free himself from the inhibiting forces of the chair and desk. He will be able to see, touch, feel, smell, and listen to a living outdoor natural world. He will discover new areas of interest which hopefully, will stimulate a thirst for more knowledge.

Some teachers may feel uncomfortable in this new environment. The outdoor school staff is prepared, therefore, to render assistance. Although teachers are encouraged to plan with their classes programs of their own design to fill their particular needs, the outdoor school staff is prepared to plan a part of or even an entire program, if some teachers prefer this arrangement.

Some teachers may be reluctant to leave the formal atmosphere of the classroom and enter the informal atmosphere of an unfamiliar outdoor teaching environment. Some may harbor an uneasy feeling that because of their unfamiliarity with the natural environment they will not be able to adequately answer their students' questions about certain natural phenomena. This uncertainty may be used to an advantage. The teacher can stimulate students to search for answers themselves. If the child is compelled to discover the necessary information for himself, he may find in the course of his readings other interesting related facts, which, in turn, requires further exploration.

Because outdoor education is not a discipline in itself, a teacher needs only the ability to teach, an eagerness to try new experiences, and, in some instances, a willingness to learn along with the class. A teacher should have the courage to say, "I don't know" and sufficient interest in the student to say, "But let's see if we can find the answer."

Teachers should keep in mind that planning and preparation is necessary to make the outdoor school experience a meaningful one. Programs that do not include advance preparation and follow-up decreases the value of the outdoor education experience. One of the purposes of the program is to instill within the child a realization of his relationship to the natural world around him. This certainly cannot be accomplished by suddenly placing him in an outdoor learning environment and just as suddenly withdrawing him from it. The importance of pre-planning and follow-up to the outdoor experience cannot be too strongly stressed.

OUTDOOR EDUCATION INTERPRETED

By
Charles Holtzer

Basically, outdoor education is an extension of the school curriculum into the outdoors where the natural resources serve as teaching tools for learning experiences in language arts, science (biological and physical), social studies (including conservation of natural resources and citizenship), math, art, music, home economics, health, recreation and physical education. Education in the outdoors is partially based on the premise that "learning can be fun". Emphasis in an outdoor education program is placed upon teaching the whole child; that is, concern for helping him develop not only his academic skills but his social and lifetime leisure skills as well.

Learning Through Direct Experiences

Outdoor education is not a subject in itself; rather, it involves a way of learning in a different and informal learning environment, a living classroom. Outdoor education not only attempts to give a child knowledge, but to provide him with countless opportunities for vital and meaningful experiences through the application of such knowledge in solving real life problems. The child lives his educational experiences through learning by doing. There are many concepts, for example, which a student cannot possibly fully understand unless he is given the opportunity to have a direct experience involving such concepts. A child cannot visualize the concept of an acre of land merely by

knowing that it consists of 43,560 square feet, any more than an adult can visualize the concept of the speed of light, upon learning that light travels at a speed of 186,000 miles per second. If, however, one has an opportunity to measure out, walk over and/or see an acre of land, such an experience should make the concept of an acre more meaningful. True learning can be enhanced immeasurably through opportunities to apply knowledge in real life situations.

In social studies, a student cannot help but gain a better understanding of the problems and hardships faced by the early American settlers by participating in a social studies field experiment: that is, encountering problems and finding solutions through actually planning the development of a community in a wilderness area. How will a leader be selected? What will be the division of labor? What rules will be established? What are the local natural resources and how can they most effectively be used? And so on. Meeting such "hardships", including preparing food out-doors, leaves vivid impressions on young minds. Such experiences helps the child to realize that the amount of value he places upon a respect for the rights of others is directly related to his own security and comforts.

Not only is there an opportunity for the child to gain more insight into the problems and hardships faced by the early American settlers, but also insight into the hardships encountered by people living in underdeveloped nations throughout the world today. Perhaps as a result of such potentially meaningful experiences, the student may also develop empathy for the people living in these countries.

One of the major objectives of outdoor education, then, is to provide children with unique and direct learning experiences in real life situations, experiences which cannot be easily duplicated in the formal classroom where, for the most part, artificial situations are more prevalent. Outdoor education is not a substitute for the formal classroom but rather, it is a means of complementing classroom learning by making more vital and meaningful, through outdoor experiences, subjects taught in the classroom.

Motivating the Underachiever

Outdoor education helps to provide motivation for many slow learners, for the outdoor learning environment is informal and there are relatively few children who do not respond favorably in some manner to a natural outdoor setting, free of the confinement placed upon them by the four walls of a classroom, desks and chairs. The urge to adventure, explore, and discover is inborn in almost every child. A child who is a slow reader, for example, may be stimulated by the thrill of seeing a woodchuck to read a book on wildlife. The classroom teacher might never discover that Tommy, an underachiever, was very interested in reptiles unless Tommy was placed in a situation where he would have many opportunities to manifest this interest. An alert teacher could capitalize on Tommy's interest through helping him plan and develop projects involving reptiles, which would bring in such disciplines as: language arts (taking notes on observations), math (taking measurements of various species of adult turtles, making a count of certain species of reptiles in a given area and estimating the total population of these species in the whole area), social studies (learning about the economic importance of snakes to farmers - a natural check on propagation of rodents), and so on.

The undermotivated child may also be stimulated by experiences in self-discovery, experiences which are not normally possible in the classroom. Some slow learners may never improve substantially simply because their latent abilities never had an opportunity to manifest themselves.

Utilization of All The Senses

Since learning in the outdoors, through direct experiences, encourages use of all the senses -- hearing, seeing, tasting, feeling and smelling, retention of knowledge appears to be long lasting, according to research studies. These studies further show that individual achievement in the outdoor school is often higher in certain areas, than achievement in the classroom.

Stimulation of Creative Ability

Creative ability and measured intelligence (I.Q.), according to research studies, are not identical. Creative ability can be developed, extended and improved. There are many opportunities in an outdoor education program for developing latent creative talent in all children, regardless of their academic level.

Knowledge, application of knowledge, providing motivation for the slow learner and presenting stimulating challenges to the "normal" and gifted student, are not the only objectives of an outdoor education program. Development of good habits, values, attitudes, appreciations and lifetime leisure skills are also important aspects of the program.

Appreciation For Natural Resources

It is essential, for example, that our young people develop a positive attitude and more than casual interest in our natural resources, which not only provides them with sustenance but with opportunities for engaging in many lifetime recreational pursuits such as camping, fishing, hiking, swimming, hunting and boating.

In the days when the United States was less industrialized, our children had the forests, lakes and fields as their playground. The rapid growth of industrial cities divorced our children from the land, the land which played so vital a role in the development of a well-rounded life. The restlessness of our youth today may be at least partially attributable to the ever-widening chasm between them and living close to the land. There has become an increasing need to retain an awareness, understanding and appreciation of the contributions made to society by our natural resources.

Our young people of today, who will be our adult voting citizens of tomorrow and stewards of our natural resources, need to develop a conservation ethic if our natural resources are to continue to furnish us with our needs. The health, wealth, and strength of our nation is directly related to its natural resources. It is essential, therefore, that our children have the opportunity to explore, understand and appreciate their natural heritage, to come in contact once again with the land.

Development of Lifetime Leisure Skills

As a result of the steady increase in leisure time through a shorter work week, perhaps our schools need to assume the responsibility of helping their students develop individual, non-team type recreation skills, skills which they can utilize during their leisure time when they become adults, and not to have to depend on others in order to recreate, as they would in a team sport. Unfortunately, many parents have not assumed this responsibility either because of apathy, lack of skill to teach their children a particular outdoor recreational activity, or because they are caught up in a complex, fast moving society and either do not have or are not willing to make sufficient time to devote to helping their children in this area.

Development of Social Skills

In addition to developing academic and recreational skills, children must also learn to live with others. Social skills can also be developed and/or improved through an outdoor education program. Children soon learn, when building a fire for a cookout, that each individual must cooperate, and must attend to the chore assigned to him if the cookout is to be a success. It is one thing to sit next to one's friend in the classroom but quite another situation when working and living together. There are countless other opportunities in an outdoor school program for children to have valuable experiences in the development of social skills.

Objectives of Outdoor Education

To somewhat consolidate and bring into better focus what has been described so far, the next section lists some of the more common objectives of outdoor education. It should be emphasized that an outdoor education program should not be a series of isolated experiences from the day to day work of the classroom, but rather, made an integral part of, and consistent with, the formal school curriculum.

PROGRAM
OBJECTIVES

OBJECTIVES OF OUTDOOR EDUCATION

A. Social adaptation

1. Provide child with opportunities to discover his place in a group through a better understanding of how people live, learn, work and share together.
2. Provide training in citizenship through give and take of community living.

B. Deeper insight into child learning by teacher

1. Provide teacher with opportunities to observe the "whole" child through informal teaching situations. It has been noted that a more accurate picture of the total child is given when he is observed in a more informal and relaxed environment.
2. Opportunities for the teacher to capitalize on a slow learner's interest in some specific area related to the outdoors, by relating that interest to an activity which can be adapted into a classroom environment.

C. Educative Stimulation

1. Confrontation by students with real life situations--experiences which cannot be adequately duplicated in the classroom.
2. Make subject matter more vital and meaningful by adding realism through direct experiences; providing opportunities for practical application of knowledge gained in the classroom.
3. Knowledge of one's interrelationship with his natural environment. Development of feeling of comfort in a natural environment--how to live in it, feel at home in it, survive in it, enjoy and appreciate it.
4. Opportunities to demonstrate certain skills not possible to do in the classroom, which may evoke achievement, satisfaction and leadership recognition by one's peers. Such experiences can be of tremendous value in motivating underachievers and in helping students lacking in social skills.
5. Providing stimulating challenges to the gifted child along with development of humility toward natural phenomena.

6. Opportunities to develop appreciation and respect for our natural resources through a realization of the vital impact natural resources has had upon all societies throughout the world.
7. Opportunities for more creative expression, since informality of outdoor learning often releases inhibitions of children created in the more formal classroom, and which can affect the learning process.

D. Opportunities for purposeful work experiences

1. Those which benefit the whole group.
2. Those which benefit the individual.
3. Those which benefit the forest community.

Work experiences provides the child with opportunities to do something unselfish and to become aware of the need for teamwork in order to achieve group goals.

E. Development of self-reliance and independence from influence of family and urban life.

1. Pleasurable and constructive use of leisure time through development of outdoor recreation skills which one can participate in alone.
2. Discovering new interests and talents in oneself.
3. Learning to care for one's own personal effects.

F. Aesthetic appreciations.

1. Provide opportunities for experiences which will help inspire a child in the areas of art, music, prose and poetry as related to the outdoors.

The above represents only a few of the more common objectives of outdoor education; there are many others. Of course, it would not be possible for one classroom teacher to concentrate on all of the objectives listed here, nor could all of the objectives outlined above be met in a one or two day program. It is suggested, therefore, that each teacher decide what objectives

are most important to emphasize with his or her class at the outdoor school, depending at least partly upon the kind of community in which the children live and their socio-economic backgrounds. For example, if the school district is located in a densely populated urban area, there is a possibility that many of the children living there have had little exposure to the outdoors. The classroom teacher in such a locale may prefer to concentrate directly upon such subjects as forests, wildlife, soil, water and minerals in order to give the class an understanding of, and appreciation toward, natural resources.

In a school situated in a less urbanized area where woodlands may be more plentiful, thus providing children in such areas with more opportunities for exposure to the outdoors, the teacher may decide to concentrate more upon enriching the total class curriculum through utilization of the outdoor environment. For example, the class may be studying a social studies unit on historic local industries in the State. One activity at the outdoor school might be to seek out and observe the remains of such industries and gather evidence to determine what kinds of industries were located here and why this particular location was chosen.

Of course, just because a child had access to woodlands a good part of his life doesn't in itself mean he has any knowledge or true appreciation of what it contains and how it benefits him and the community in which he lives. Therefore, a good deal of emphasis may also be placed upon studying the natural resources of the area and how these resources are interrelated with each other and with man.

WHAT IS A TREE?

A
tree
is God's
creation
everywhere
on earth in-
cluding Brook-
lyn. It's said man
once lived in trees .
When he climbed down,
life never again was to
be quite so simple ... yet
only then did the tree get
truly appreciated. For here
was food and fuel and shelter.
Then a weapon, a tool, a wheel-----
and transportation. And now it's---
floors, doors, veneers, piers, baskets,
caskets ... rubber for gaskets. It's a
handle for brooms, shovels, rakes ... syrup
on pancakes. It's paper and paints ... tars,
spars, boxes and boxcars ... storage bins and
... bowling pins. It's toothpicks and matchsticks..
... even plastics... material for distillation. lamina-
tion, insulation ... windows for ventilation, and a
thousand and one other we-can't-do-withouts. Yet few
people look at a tree in the same way. To the lumberjack
it's a Goliath to be sent crashing and thrashing to the
echo of "Timbe...e...err!" To the small boy it's a favor-
ite and strategic place...where you build a shack, shag a cat ,
spot a woodpecker, cut slingshots and fishpoles, hang old tires -
and tie-up "enemies". To the naturalist it's probing a fascinating
world of buds, blossoms, bark, branches, needles, cones and leaves...
spectacles of color...and some 1,035 domestic species. (Yet to a base-
ball player it's as simple as a stick of second growth ash, sized and shaped
to "feel like a million.") To the artist it's inspiration...alone on a wind -
swept hill, timberline patchwork on a mountainside, thick and verdant in a valley.
To the homeowner it's beauty and shade and property value...also digging, planting,
pruning, edging, feeding and a lot of other weekend work. To the hobbyist and crafts-
man it's a new bookcase, picnic table, panelled den, plywood shelves... a chance to be-
come downright "immortal". To the lumberman it's a bustling big business, measured by
the billions of board feet. But most of all, a tree remains what it was in the first.

place...man's
ever-useful ,
ever- lasting
friend. For
we'd sure be
"stumped" for
a mighty lot
of things in a
world without trees!

From - The MONTANA Forest Products Bulletin

CLASS

PREPARATION

FORMULATING CLASSROOM OBJECTIVES AND PLANNING ACTIVITIES

The teacher should plan and discuss with the class the activities to be covered at the outdoor school well in advance of the trip. The more work done prior to the outdoor experience, the more value will be derived from the trip itself. For instance, if time is spent in the classroom in the study of the characteristics of amphibians, their physical make-up and economic importance to man, more time can be spent outdoors in locating the habitats of specific species of amphibians, identifying them, and observing their influence upon the natural environment. The outdoor school, therefore, should serve as a living, outdoor laboratory where observations and studies can take place and where solutions can be found to problems concerning a particular unit of study discussed in the classroom.

In preparing for their trip, a class may wish to write away to a conservation agency (see appendix for a list of organizations) for some written material on soil erosion or some other special subject they wish to study in advance of their visit to the outdoor school. Instead of writing to the President of the United States in order to gain proficiency in writing letters, children may well be more motivated in writing a letter to which a response will more likely be made.

FOLLOW-UP IN THE CLASSROOM

It is recommended that the classroom teacher and the class evaluate the program after returning from their visit to the Center. What positive gains were made? Were all of the objectives met which the class developed? If not, why? In what areas could planning have been better? And so on.

Further in-depth "research" projects which were started at the outdoor school should be continued in the classroom. For example, an intensive study might be made of the Indians and early settlers who lived in the area. New teaching units may be developed, such as how the geological characteristics of a country affects its history. Exhibits and displays may be set up in class as a result of the trip, and perhaps a class play written about the childrens' experiences at the Center, which might be presented to another class or at a school assembly.

Both pre-planning and follow-up are extremely important if the visit to the outdoor school is to be a truly valuable and meaningful experience.

GENERAL SUGGESTIONS

Group Control

1. In order to avoid discipline problems while at the Outdoor Education Center, the classroom teacher should impress upon the children that coming to the outdoor school is merely an extension of the school program into an outdoor setting. The excursion should not be considered a school holiday. Although we hope that the children will have an enjoyable time, the purpose of the trip is not to provide entertainment.
2. Talk about group behavior in an outdoor setting and encourage the children to participate in the discussion. Ask them what rules of conduct are important, when making a trip such as this, which will be of benefit to the whole class and to each individual, in terms of learning, enjoyment, and personal safety. The teacher might use the term "Woods Etiquette". Guide the children in developing their own rules; they are more apt to follow them than if they are told the rules by which they must abide.
 - a. Discuss proper rules of conduct on the bus, at lunch time, and in the out-of-doors.
 - b. Discuss the importance of protecting our natural resources against malicious destruction.
 - c. Follow the rules of the woods:
 - (1) Stay with your group. Why?
 - (2) No running on trails. Why?
 - (3) Don't throw rocks or branches. Why?
 - (4) Be quiet while on the trails. Why?
 - (5) Avoid littering; help keep the woods clean and beautiful. "We are guests."
 - (6) Wildflowers and other plants are for everyone to enjoy. PLEASE DON'T PICK WILD FLOWERS OR ANY OTHER PLANTS!! This is a Union County Park Rule!

3. The classroom teacher is responsible for maintaining student discipline in his or her class while at the outdoor school. The teacher is also responsible for checking class attendance before boarding the bus in the morning, at lunch time and before leaving the Center in the afternoon.

4. Upon arrival at the outdoor school, do not allow children to walk away from the bus until directions have been given by a member of the Center staff.

Program

1. Establish positive attitudes by discussing the many opportunities for a variety of experiences in an outdoor school.

a. Cooperating with and helping each other.

b. Respecting others' opinions, ideas, beliefs, in order to live enjoyably together.

c. Learning about the natural world through first-hand experiences.

d. Learning to be alert and observant by really looking and really listening when walking in the woods.

e. Sacrificing pleasures of the city temporarily without complaint.

f. Opportunities for practical application of knowledge. Solving real life problems in real life situations, thus helping to make accumulated knowledge more meaningful to the student.

g. Learning to accept pleasantly the "hardships" of a more simple outdoor life. Developing empathy for the American Indian, pioneer and for people living in underdeveloped countries today.

h. Discuss outdoor experiences in relation to classroom work. How outdoor experiences can help in:

Social Studies
Science
Poetry
Literature
Composition
Spelling

Arithmetic
Reading
Art
Music
Health
Physical Education

2. Encourage the class to think of questions they would like answers to,² record them and tell the children to direct these questions to the group instructors while out on the trail. The questions should pertain to the theme of the field trip.
3. Select one or more students from the class to give a verbal report of the group's activities to other classes back in their own school.
4. In order to get the attention of the group while on the trails, or in the lunchroom, the leader will raise his hand. This is a signal for everyone to stop where they are, raise their own hand, and remain quiet.

WHAT TO BRING

1. Children should bring notebooks and pencils in order to record pertinent information. The classroom teacher may wish to have children refer later to the notes they have taken for the development of projects back in the classroom.
2. Before leaving school, please check to see that the children are wearing suitable outdoor clothing and proper shoes. Check the weather forecast the day before the trip and advise children to wear raincoats, hats and boots if necessary.

We will be conducting a program regardless of the weather. If it rains, the children will spend part of the day out on the trails, provided it is not raining heavily, and part of the day on indoor activities. In the event of heavy rain, the entire program will be conducted indoors.

Boots alone should be taken along if it rained a day or two before the scheduled visit to the Center, for the trails may still be muddy.

3. Each child should wear a large name tag pinned on the front of the jacket with his or her first name printed in one inch high letters with a black marker.

4. Children should wear warm clothing if the weather is cold. They will be outdoors most of the day.
5. Cameras and binoculars may be brought along by the children if they wish.
6. Lunch cannot be provided by the Center. Teachers and pupils should bring lunch with them. Vending machines serving candy, hot cocoa, coffee (cream and sugar only), chicken soup and pea soup, are available in the lunch area. The children should bring change with them (both nickels and dimes).

HEALTH AND SAFETY

The teacher should discuss the following health and safety suggestions with the class.

1. Remember that illness and accidents can often be prevented. Most are due to carelessness or disregard for the rules of common safety.
2. Avoid overeating. Strenuous activities after lunch may cause digestive upsets.
3. Wear clothes suitable to weather conditions.
4. Get enough sleep and rest the night before the trip. The day at the outdoor school will be strenuous and you will not be able to enjoy the trip if you are tired.
5. Wash hands before eating.
6. Do not drink water from springs, ponds or streams.
7. Do not attempt to catch or handle any animal without permission from the group leader. This includes frogs, toads, salamanders and snakes. Special precautions must be taken with mammals, for they can carry rabies.

8. Become familiar with the appearance of poison ivy. Don't touch or allow clothing to come in contact with any plant with which you are unfamiliar.
9. Avoid tasting or eating leaves or berries with which you are unfamiliar.
10. Watch where you are walking; look in front and above you.
11. Don't run while in the woods.
12. Keep well behind the person in front of you, when walking on a trail, in order to avoid having a tree branch snap back in your face.
13. Keep away from the banks of any body of water and from any steep slope.
14. Never wander off by yourself.
15. Clean all scratches and cuts as quickly as possible and seek first aid.
16. If an injury seems serious, don't move, call for help.
17. Sit down or lie down if you feel faint.
18. In case of a nose bleed apply slight pressure to the bridge of the nose.
19. Don't rub your eye if you get something in it; you may cause further discomfort as well as injury to the eye.

20. Remember that it is important to relax during lunch so that you will be refreshed and able to go on with the day's activities.
21. Rocks should lie where they are; do not throw them. Someone might be seriously injured.
22. Wear comfortable and loose-fitting clothing. Girls should wear slacks. Good broken-in sturdy walking shoes are desirable. Discourage children from wearing leather-soled shoes or sneakers, especially smooth-soled sneakers, if possible.

NOTE: For the comfort of the teachers, it is suggested that they dress comfortably, keeping in mind that they will be accompanying their classes on field trips. It would be advisable for the women to wear slacks and flat heeled shoes.

CLASSROOM TEACHER'S FINAL CHECK LIST

PRE-TRIP

Check with school principal about insurance coverage
Parent consent forms
Emergency address forms (bring to Center)
Discuss and review group behavior, health and safety procedures.

FOLLOW-UP

Pupil evaluation }
Teacher evaluation } See Appendix for evaluation forms

Plan and develop activities in the classroom relating to the outdoor school program.

Please mail the evaluation forms to the Center as early as possible after the class visit. This information will be of great value to the Center in planning future programs.

AMERICA THE UGLY

By Brent Renfrow

Oh pitiful for smoggy skies
For jungles made of stone.
For blazing mountains tragedies,
Where bubbling brooks did roam.
America! America!
We shed our trash on thee,
And now regret the mess we made,
From sea to shining sea.

How terrible the picnic trash,
The beer cans by the road.
The sewage pipes that feed the streams,
Their deadly, smelly load.
America! America!
With lakes of glistening foam
And airplanes spraying poisons on,
The dear land we call home.

Taken from:
FOR THE BEAUTY OF AMERICA
By Will T. Johns

The National Wildlife Federation
1966

INTEGRATION
OF
OUTDOOR EDUCATION
WITH THE
SCHOOL CURRICULUM

OUTDOOR EDUCATION AND THE SCHOOL CURRICULUM

Lecturing is perhaps the most widely used method of teaching, but it is a method which many educators agree is not entirely efficient under all circumstances. As babies we did not think in words, but rather, we reacted to stimuli. Our five senses guided us through that stage of life. Even as we grew older we learned words through stimuli and association. We felt what heat was, smelled the fragrance of flowers and new mown grass, saw the white, puffy clouds in the sky, tasted whatever our little hands grabbed hold of, and heard the many strange sounds which surrounded us. What impressed us most in our young lives were things that we experienced through the use of all our senses. Outdoor education provides many opportunities for sensory as well as direct learning experiences in real life situations which can help make more vital and meaningful subject matter taught in the classroom.

The classroom teacher is aware that all subjects are interrelated and has probably had days when a science lesson led to an arithmetic lesson, and perhaps from there to language arts, followed by history and through other aspects of the school curriculum. Through outdoor education the child can gain an understanding of the relationship of man and all his knowledge to his natural environment, where all learning began.

Through math in the outdoors, children will solve real problems involving estimating distances, land measures, ratios, board feet and many others. In social studies children will have opportunities to examine historic homes and remains of old industries. They may construct shelters or tools once used by the pioneers.

OUTDOOR EDUCATION AND THE SCHOOL CURRICULUM

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Through math in the outdoors, children will solve real problems involving estimating distances, land measures, ratios, board feet and many others. In social studies children will have opportunities to examine historic homes and remains of old industries. They may construct shelters or tools once used by the pioneers.

Students can thus experience some of the difficulties encountered by the early settlers. In language arts, experiences the children will have in the outdoor environment may help enrich their imagination. From these experiences they may be inspired to write creative poems and stories, reports, and dramatizations. In science the boundaries are limitless. One only has to observe his natural environment. It is one thing to observe a lifeless frog in a jar of formaldehyde and quite another experience to observe a live frog and its behavior patterns in its natural environment.

Through outdoor education, the teacher may find that a child motivated by the realness of his experiences is often better able to understand principles and concepts. It is not implied here that outdoor education is superior to indoor education, but rather, it can make significant contributions to the total intellectual development of the child through complementing the regular school curriculum. The change from a formal to an informal learning environment and the opportunity to live, learn and work together in a child-centered community in the outdoors, combine to make a learning experience that will be long remembered by the children involved.

On the following pages are some examples showing the relationship of outdoor education activities with the traditional school curriculum. The teacher will undoubtedly think of other outdoor activities which relate to the various school disciplines and can enrich the learning experiences of children.

SOCIAL STUDIES

The field of social studies involves man's understanding of his physical and social environment. It includes knowledge about the institutions which are essential to survival and the activities which contribute to man's effective operation as a member of society.

There are many excellent and practical examples of how outdoor education might contribute to the field of social studies. For example, a study might be made of the types of outdoor park and recreational facilities available in the local community. How were they obtained and developed? Whom do they serve? What are the values inherent in these facilities?

A study involving the attitude of people toward the preservation of open space and natural areas for education and recreation might prove significant to the foregoing study. The study of the conservation movement in the United States and politics involved in it, the natural resources of the country, and its economic and political effect upon the growth of the United States, should prove to be interesting to students.

Field trips have been taken by classes in various schools to the sites of early industries developed in the local community; to abandoned farms to determine the factors which influenced the farmer to leave; to eroded hillsides and polluted bodies of water to foster discussions about conservation problems;

to historical sites and areas; to local industries, such as a lumber mill, tree farm, milk plant, mine, dairy farm, and truck farm. All of these have helped reveal to students the changing patterns of a community.

At a resident school camp discussions have centered around group living problems. Students participate in a community camp government, and engage in group planning of various activities, such as cooking out and cleaning sleeping quarters. All these activities aid in development of the student's social awareness and responsibility to self and to the total group.

Other activities related to social activities include:

- Learning about local customs;

- Studying the history of the past Indian tribes of the area;

- Organizing and participating in an Indian ceremonial typical of the local tribe;

- Constructing early pioneer tools out of natural materials and using them to dramatize the life of the pioneer;

- Learning the effects of local natural resources upon the cultural life and traditions of the early pioneer;

- Studying the economic, recreational, and aesthetic values of the local natural resources;

- Studying the problems of land use and migrating populations;

- Conducting conservation projects in camp and in the local community;

- Learning campcraft and woodlore skills which aid in living comfortably in the outdoors;

- Developing cooperative solutions to problems;

- Carrying out democratic living in a camp;

- Developing and improving interpersonal relationships.

SCIENCE

Following is a list of typical science activities which are included in outdoor education programs:

Studying the physical features of the local terrain - how it was formed, composition of local rocks and minerals and how they were formed;

Breaking apart, analyzing, and identifying rocks and minerals;

Observing evidence of the interdependence of all living and inanimate things;

Studying behavior of animal life through observation of animal tracks and other evidences indicating their activity;

Using microscope and hand lens while making field studies of minute pond life, soil, and other elements of nature;

Observing biological principles including predation, survival, parasitism, symbiosis, photosynthesis, competition, dominance, plant succession, biotic communities, and transmission of seeds;

Becoming more familiar with the value of the wildlife, vegetation, soil, rocks, and minerals of the area;

Deducing through evidence why certain forms of animal life and plant life live in a particular area and not elsewhere;

Learning certain biological principles found within a terrarium and aquarium;

Studying construction habits of birds (nests), spiders (webs), insects (cocoons);

Making soil experiments (testing and classifying);

Using simple keys for identification of insects and plants;

Testing water for drinking purposes;

Studying different types of vegetation at different elevations;

Studying astronomy through use of a telescope;

Learning principles involved in predicting the weather and maintaining a weather station;

Learning the principles of leverage in moving boulders and logs;

Interpreting topographic maps;

Observing how soil erosion and forest fires affect the ecology of a given area;

Learning forest and wildlife management practices;

Learning elementary techniques of taxidermy;

Developing skill in the proper use of a compass;

Correcting and preventing, through work projects, soil erosion;

Planting and maintaining a garden;

Learning principles of plant grafting and crossbreeding of plants.

LANGUAGE ARTS

It is difficult to read much prose and poetry without finding reference to the beauties of the natural world. Thoreau, Hemingway, Wordsworth and Longfellow are only a few writers who dealt extensively with nature in their writings. The informal atmosphere inherent in outdoor education programs offers many opportunities for creative expression by students. Indeed, what more natural and ideal place is there for writing a poem or story about the outdoors than in the outdoors?

There are many activities in outdoor education which aid the development of communications skills in students. They include:

Making field notes;
Writing letters home or to conservation agencies for information;
Writing reports about camp activities;
Maintaining a daily log;
Writing stories about the outdoors;
Utilizing camp library for reference material and literature concerned with the outdoors;
Writing reports and evaluations of field trips and other activities;
Reading Indian stories;
Story telling;
Writing and acting in plays related to the history of the local area;
Writing reports and articles for the camp newspaper;
Locating documented evidence of observations and deductions made in the field;
Labeling specimens and nature trails;
Preparing and presenting a school assembly program about camp experiences;
Reading and listening to stories, prose, and poetry about the outdoors while seated around a campfire;
Taking an active part in discussions involved in planning and evaluating trips;
Making oral reports about field trips.

MATHEMATICS

Mathematics becomes more significant and meaningful to the student when he discovers practical applications for the mathematical knowledge he has gained. Outdoor education programs provide countless opportunities for such applications. In addition, a student is more apt to understand certain mathematical concepts when these concepts are transferred into real situations.

Following is a listing of activities conducted in the outdoors which help to make the study of mathematics more meaningful:

Taking measurements of a tree involving board feet;

Learning and using a forester's formula for measuring the yield of lumber from a given tree;

Determining the size of certain areas through the use of such measurements as acres, square miles, square yards, and square feet;

Determining the flow of a given stream per second (cubic measurements);

Determining the cubic yards of dirt necessary to fill in an eroded area;

Learning how to use map instruments;

Surveying; making maps or scale models of the local terrain;

Making graphs of daily weather records;

Pacing the distance during a hike; determining time required to walk a mile;

Estimating the percentage of areas containing swamps, fields and woodlands;

Determining the percent of a slope;

Determining the time of day through the use of a sun dial;

Determining the distance across a lake and the height of a tree or a mountain through the use of geometric principles;

Reading weather instruments, and calculating temperature averages and barometric readings;

Learning the use of a compass (orienteering);

Determining amounts and computing the cost of food consumed in a camp or for a special cookout, and the cost per person per meal;

Operating a banking system at camp and a camp store, and keeping records of all operations;

Demonstrating the practical application of mathematics in the construction of a bridge or a retaining pool;

Drawing plans for a bird house;

Demonstrating the laws of leverage through lifting logs and moving boulders;

Computing the obvious and hidden costs of a school camp trip;

Observing geometric patterns in nature.

ART AND MUSIC

The outdoors abounds in a variety of subjects for photography, sketching, modeling, painting, and contains many natural materials which help to encourage creativity in students through arts and crafts. Engaging in art activities in the outdoors helps to develop in students powers of observation and an appreciation of the beauty found in the natural world. Music, too, has its place in the outdoors, for it was here that music was born - through crude musical instruments made from objects in nature. There are numerous examples

in the outdoors to demonstrate the first musical instruments made from natural materials by the American Indian.

Here are examples of art and music activities which are often contained in outdoor education programs:

Using natural materials as designs for various works of art;

Designing bird houses;

Making ceramic or wood models of animals;

Collecting and arranging dried bouquets of flowers;

Drawing and painting local outdoor scenes;

Preparing nature trail signs, charts and other illustrations of natural phenomena;

Collecting seeds, flowers, grasses, and stones for making special creative arrangements;

Listening to and recording bird calls and songs, frogs, insects, a running stream, wind in the trees;

Making leaf and fern prints through use of various media;

Constructing a relief map of the camp area;

Designing charts and exhibits of natural objects;

Learning and singing folk songs and studying their meaning;

Making Indian musical artifacts such as drums or rattles for special Indian programs;

Hiking in rhythm while singing camp songs;

Listening to the music of Beethoven (Pastorals), Edward Mac Dowell (Woodland Sketches), Groffe (Grand Canyon Suite), and others relating them to the outdoors.

PHYSICAL EDUCATION, HEALTH AND RECREATION

The outdoors offers a variety of opportunities to learn skills in physical education and recreation, and in the practice of health and sanitation. Following is a description of such activities included in present outdoor education programs:

Health

Planning menus;

Developing proper eating habits;

Learning to dress properly for the outdoors, depending upon the season;

Learning precautions to follow when looking for drinking water outdoors.

Recreation

Square and folk dancing;

Participating in nature scavenger hunts;

Learning the techniques of hunting, fishing, boating, archery, fly tying and bait casting, skiing, orienteering, woodcraft, photography;

Developing hobbies related to natural history;

Snowshoeing and ice skating;

Swimming.

Physical Education

Hiking;
Cutting logs for firewood;
Learning the proper way to ascend and descend a steep slope;
Learning to use forest tools properly;
Building and extinguishing a campfire;
Planting trees;
Trailing and tracking;
Learning the techniques of survival.

HOMEMAKING

Homemaking can be greatly enriched, and made more meaningful and interesting when carried on in an outdoor setting, for it is there where it had its beginning.

Homemaking activities found in outdoor education programs include:

Identifying, collecting, and cooking local edible plants;
Identifying and learning about many uses of herbs, including use for medicinal and cooking purposes, and learning how to grow them;
Studying diet habits of wildlife;
Planning, preparing and serving food at a cookout;
Conducting camp kitchen duties; Planning camp menus;
Studying the natural sources of dyes;
Using proper clothing in the outdoors;
Maintaining clean campgrounds and dining hall;
Practicing proper table manners during camp mealtime.

APPENDIX

APPENDIX TABLE OF CONTENTS

	<u>Page</u>
Day Schedule	45
Class Groups Form	46
Parent Permission Form	47
Emergency Form	48
Evaluation of Program	49
General Outdoor Education Activities	53
Suggested Follow-Up Activities In the Classroom	57
Sources of Publications	71
Bibliography (Annotated)	75

UNION COUNTY OUTDOOR EDUCATION CENTER

DAY SCHEDULE

9:15 - 9:30 a.m. Buses arrive

9:30 - 10:00 All classes will meet in the barn for a general orientation before activities begin.

10:00 - 11:50 Field trips and other activities

Each group will meet with the leader assigned to it.

11:50 - 12:30 p.m. Wash up and lunch

All groups return to the barn for lunch.

Toilet facilities for the children are located on the West side of the barn. Sinks are located in the barn. Toilet facilities for adults are located in Building #12 (women), which is the first building next to the barn, and building #4 (men), the fifth building from the barn.

12:30 - 2:20 Field trips and other activities.

2:20 - 2:30 All groups return to barn.

2:30 Children board buses.

NOTE: The times given above may vary, depending upon school bus schedules.

CLASS GROUPS

The class should be divided into two groups
and a leader and recorder chosen for each group.

1. Leader

2. Recorder

3.

4.

5.

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1. Leader

2. Recorder

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15.

Union County Outdoor Education Center
2 Glenside Park
Berkeley Heights, New Jersey

Suggested

PARENT PERMISSION FORM

I give permission for _____
(Name of child)

of _____
(Street address) (City or town)

to attend the Union County Outdoor Education Center on _____
(Date)

I shall assume the same responsibility for my child as I would if my child
was in school.

(Signature of parent or guardian)

Union County Outdoor Education Center
2 Glenside Park
Berkeley Heights, New Jersey

Suggested

EMERGENCY FORM

Date _____

NAME OF CHILD _____ AGE _____

Name of Parent(s) _____

Address _____ Phone # _____

Other address and/or telephone number where you may be reached.

Other person to be notified in case you may not be reached.

_____ Phone # _____

Name and address of family physician _____

_____ Phone # _____

Permission is hereby granted for the Union County Outdoor Education Center to select a physician and/or associated hospitals to administer medical and surgical help to the above named student, should the need arise, and the parents cannot be reached.

(Signature of parent or guardian)

(date)

Union County
OUTDOOR EDUCATION CENTER

Administered by the Linden Board of Education - Linden, New Jersey

EVALUATION OF THE OUTDOOR EDUCATION PROGRAM

In order to provide the most effective, yet enjoyable educational, social and recreational experiences possible for children who visit the Outdoor Education Center, we continually seek evaluation data which will help us in the further refinement of our curriculum offerings.

The attached evaluation form is the instrument we are using for this purpose. The information we glean from this form will be of great value to us so long as you are perfectly frank in your answers to the questions asked.

So that our evaluation data will be as complete as possible, we have also prepared an evaluation form to be completed by each one of your pupils.

Will you please complete the Teacher Evaluation form, and have your students complete their forms as soon as possible, and mail them to the Union County Outdoor Education Center, #2 Glenside Park, Berkeley Heights, New Jersey 07922.

Your consideration and cooperation in this endeavor would be most appreciated.

PLEASE NOTE: We have purposely omitted a place for you to sign your name, in order to remove any inhibitions you might have for making candid constructive criticisms of the program. We sincerely welcome your frank opinions.

Please feel free, of course, to sign your name and indicate the name of your school, if you so choose, on the bottom of the last page of the form.

Charles Holtzer, Director

Union County
OUTDOOR EDUCATION CENTER

Administered by the Linden Board of Education-Linden, New Jersey

TEACHER EVALUATION

A. The Program

1. Which activities did you feel were most valuable in contributing toward the educational growth of your students? Why?

2. Which activities did you feel were of least value? Why?

3. Were there any areas in the outdoor education program where carry-over into the classroom was especially relevant for your class? Please elaborate.

4. Were there any activities which you feel should have been emphasized more? If so, please elaborate.

5. Have you engaged in, or are you planning to engage in, any follow-up activities in the classroom? If so, please describe them briefly.

6. Would you find this program more valuable if your class visited the Center for two or more consecutive days?

Teacher Evaluation

B. Leadership

1. What strengths did you observe in our instructional staff? Please refer specifically to individual activities and names of instructors.

2. What weaknesses did you observe in our instructional staff? Please refer specifically to individual activities. We would appreciate your frankness in response to this question, for we desire to maintain quality instruction. Please indicate names of instructors.

C. The Class

1. What were the general reactions of the class to the outdoor education program? Please elaborate.

2. Did you observe any change in behavior patterns and/or academic abilities in individual children while they were participating in the program? Please give specific examples.

If you have any additional general comments or suggestions to make which were not covered above, please make them here.

Union County
OUTDOOR EDUCATION CENTER
Berkeley Heights, New Jersey

Administered by the Linden Board of Education

PUPIL EVALUATION

1. What activity or activities did you enjoy the most? Why?
2. What activity or activities did you enjoy the least? Why?
3. Were you able to do all the things you had hoped, when you visited the Outdoor Education Center? If not, list those things you had wanted to do but did not have an opportunity to try.
4. Was the time devoted to each activity too long or too short? Please name the activities and explain your answer.
5. What did you learn at the Center which has helped you with your work in school? In what ways were you helped?
6. How did you feel about the program in general? Check one:
 - a. Very valuable
 - b. Valuable
 - c. Not very valuable
 - d. No value
7. What suggestions do you have for improving the program?

TEACHER PLEASE NOTE:

We have many classes visiting the Center and while we are sincerely interested in learning the reactions of all the children who have participated in our program, it would be extremely difficult for us to read carefully and thoughtfully each child's evaluation.

Consequently, we would be most grateful if you would help us in this endeavor by summarizing on the Pupil Evaluation form significant answers given by your pupils to the questions. Please do not spare our feelings by omitting negative comments, for such action would make this evaluative instrument less valid.

It would be preferable if your summation was done on one or more separate blank sheets of paper. This form does not allow sufficient room for all answers.

ADDITIONAL COMMENTS MADE BY PUPILS

Please add here any unusual comments made by your pupils which were not covered in the questions asked above.

UNION COUNTY OUTDOOR EDUCATION CENTER

GENERAL OUTDOOR EDUCATION ACTIVITIES

ACTIVITIES INVOLVING OUTDOOR LIVING SKILLS

Use of compass - orienteering

Use of knife, hatchet, axe

Map reading

Hunting - bow and arrow, rifle-safety

Fire building and safety

Survival techniques - living off the land

Outdoor cooking

Construction of outdoor shelters

Fishing

Interpreting nature's signs

First aid

Selection of proper wood for various
campcraft activities

NATURAL SCIENCE AND CONSERVATION ACTIVITIES

Observations:

Soil erosion (water and wind)

Amphibians

Chemical weathering of rocks and
trees

Reptiles

Weather

Insects

Pine plantation

Seasonal changes in a forest

Birds

Types of vegetation on a slope at
different elevations

Water pollution and how it has
affected the local area

Adopt a tree and keep a diary of it for
a class term, observing changes in the
tree and animals that visit it

Collections:

Rock and minerals

Seeds

Different soils

Leaves

Fossils

Twigs

Seashells and fresh water shells

Insects

Seaweed

Bird's nests (last year's)

Studies

Animal behavior

Edible plants

Poisonous plants

**Astronomy - effect of the moon and sun on bodies of water, constellations,
light years**

Identification of plants

Identification of birds' nests

Identification of animals and their tracks

Identification of calls and songs of animals (recordings available)

Transpiration

How green plants produce food (Photosynthesis)

Symbiosis (two different organisms living together)

Parasitism

Seeds (means of dispersement)

Rocks and minerals (Splitting open and studying with a hand lens)

Plant folklore

Ecology (relationship of plants and animals to their environment)

Effects of misuse of natural resources

Doing:

**Plantings of grass, shrubs, and trees (to control erosion, provide food and
cover for wildlife beautification)**

Bird banding (Federal license required)

Soil tests

Growing plants from cuttings

**A tree and animal census of a local area to determine variety and number of
species; live-trap and tag the animals**

Surveying

Gardening (vegetable and herbs)

Pruning, thinning, and selective cutting of forest trees

Embed insects and plants in plastic for a permanent collection

Moonlight hikes

Nature photography (flowers, star and moon trails, animals)

Constructing:

Check dams

Animal shelters (bird houses, brush piles)

Nature electric quiz boards

A bird blind (for observing and photographing birds)

Bird feeders

Cages (temporary homes for wildlife)

Nature trail and nature trail signs

Riprapping (control and prevent soil erosion)

Small outdoor zoo

Fire breaks

Demonstration models depicting conservation principles

Live animal traps

Bridges

Making:

Plaster casts of animal tracks and leaves

Herbariums (mounted collection of pressed, dried plants)

Terrariums and aquariums depicting plants and animals indigenous to the local area

Crafts, such as rustic jewelry, made from natural materials

Spore prints

Graftings of plants

Maple syrup (tapping of maple trees)

Leaf prints (spatter, crayon, ozalid prints, and blueprints)

Dyes from plants

Weather instruments

Visiting:

Abandoned farm

Modern dairy farm

Fish hatchery

Flood control dam

Agricultural experimental station

Reservoir

Water purification plant

Sewage disposal plant

Abandoned lumber camp

SUGGESTED FOLLOW-UP ACTIVITIES IN THE CLASSROOM

UNION COUNTY OUTDOOR EDUCATION CENTER
2 Glenside Park
Berkeley Heights, New Jersey 07922

SUGGESTED FOLLOW-UP ACTIVITIES IN THE CLASSROOM

The Center recognizes the time limitations imposed upon classroom teachers by many classroom responsibilities. The amount of time devoted to follow-up activities undertaken by the teacher back in the classroom, therefore, will be largely influenced by the above. This problem will be counteracted in some measure, however, by the degree of interest and enthusiasm the teacher may have acquired for outdoor education after visiting the Center, the extent of the educational potential of outdoor education envisioned by the teacher, and the degree of interest and enthusiasm manifested by the pupils themselves. Somehow one always manages to find time to do the things he or she really wants to do.

If the outdoor education experiences your pupils will have when they visit the Center is to have any lasting value, not only in terms of reinforcing what the children may have learned during their visit, but also in terms of opening doors to new pathways of knowledge not hitherto explored, then it behooves the teacher to find some time to plan and carry out follow-up activities in the classroom.

Do not look upon the following suggested follow-up activities as something to work on in addition to other classroom work, but rather, plan them as an integral part of the regular classroom curriculum. For example, if your science unit includes the study of birds, have several of your pupils construct some

simple bird feeders (we have mimeographed sheets showing how to make them) and hang them outside the classroom window. This is an especially good activity during the winter when birds are more desperate for food. Experiment with different kinds of bird food and have the children observe the kinds of birds that are attracted to different foods. Note and record the habits of different birds while they are feeding. A field guide on bird identification (see Bibliography in the Appendix of this Guide) can help get the class started on an interesting and exciting activity.

If your science unit includes the study of insects, perhaps it would be possible to take a short trip around the school building to find and observe different species of insects, where they live and what they eat. Take along some hand magnifying lenses. It is not necessary to go to a park or some other wooded area to study natural phenomena. A great deal can be done just outside the school building.

The following is a list of suggested follow-up activities which classroom teachers have actually tried out and found valuable. The ideas presented here are intended to serve only as a beginning. The resourceful teacher will undoubtedly think of many other activities which will meet his or her own specific needs more adequately than the ones given here.

SCIENCE

1. Study the significance of cloud formations. Construct weather instruments from household items and make daily weather predictions. Assign a different group of children every day, every two or three days, or every week to make the daily predictions. Determine which group

made the most accurate predictions throughout the school year and give them some type of award.

For information on weather forecasting and suggested activities, including constructing weather instruments from home materials, obtain a copy of: "Everyday Weather and How It Works" by Herman Schneider, Whittlesey House, New York, 1951. See also the Cornell Science Leaflet, "Weather" Volume 54, Number 2, January, 1961.

2. Study microclimates. This activity involves taking the temperature of the air at different heights and in different places. The purpose of the activity is to demonstrate that the temperature registered on either an indoor or outdoor thermometer can vary greatly, depending upon where the thermometer is placed. For example, note the temperature of a thermometer hung on the classroom wall at an average height. Next, note the temperature when the thermometer is placed close to the floor and when suspended from a ceiling light fixture close to the ceiling (turn off the light fixture so that its heat does not affect the reading). Place the thermometer on one end of the room and then on the other end. Take a reading with the thermometer placed close to cement pavement outside the classroom on a sunny day. Compare this reading to the average temperature for the day. Compare both readings to that of "blacktop" pavement. Compare temperatures on bare earth and in grass. Take a reading of a thermometer placed in the hollow part of a tree, etc. Discuss with the class what causes such wide differences in temperatures both inside a room and outdoors. Different plants and animals, including

insects, have different temperature requirements. This is one of the reasons why different species of plants and animals are found living in only certain places. For a more in-depth study of microclimates, obtain a copy of the Cornell Science Leaflet, "Little Climates", Volume 55, Number 1, October, 1961. See also "Little Climates", in the publication, The Instructor, Owen Publishing Co., Dansville, New York, 1959, Vol. 69, No. 2, pages 34-35, 64 and 78. The article suggests simple activities for elementary grades involving microclimates.

3. Request one or two pupils bring to class samples of pond water from different ponds and observe the samples under a microscope.

As a matter of fact, the kinds of natural materials that can be brought into the classroom for observation and study is unlimited. Children are very accommodating in this respect and you can be almost certain they will find, after school, practically anything you would want them to bring in.

4. Request pupils to bring to class rock and mineral samples. Attempt to identify these with a mineral and rock testing kit. This can easily become a fascinating lifetime hobby for some children.
5. Request pupils bring in samples of soil from different areas for soil testing experiments with a soil testing kit.
6. Secure an incubator (can be homemade) and attempt to hatch chicken eggs.

7. Experiment with seed growth. Plant seeds in a pot and keep it in a dark place or cover it with dark material. Plant seeds in another pot and give it light but no water. Plant seeds in another pot and, if during the winter, keep it outside; otherwise, keep refrigerated, perhaps in the school kitchen or perhaps a child can keep it in his refrigerator at home. Observe seed growth in each pot over several days. Lima bean seeds grow rather quickly and so these might be used. Discuss results of the experiment and what requirements seeds have in order to survive and germinate.
8. Make a collection of seeds from different trees and flowers and observe each type closely. Determine, by noting their physical characteristics, how different seeds travel from one place to another. Some stick to the fur of animals, and others are designed to be carried by the wind, etc. For more information on seeds see the Cornell Science Leaflet, "Seeds", Volume 54, Number 3, March, 1961. Also obtain a copy of: "The Beginning Gardener" by Katherine Cutler, Barrows, New York, 1961. The book gives directions for planting seeds indoors, as well as planting vegetable, herb and wildflower gardens. Other books for elementary pupils and their teachers are: "Play With Seeds," by Millicent Selsam, Morrow, New York, 1957, and "The Wonders of Seeds," by Alfred Stefferud, Harcourt, Brace, New York, 1956.
9. Build and maintain a terrarium. Ask your pupils to bring in a couple of small frogs or toads, some insects, some small plants, including moss and fungus. A terrarium serves as a wonderful demonstration

depicting the life cycle, including transpiration, precipitation, photosynthesis, predation, parasitism, and symbiosis. For detailed instructions on building a terrarium, obtain a copy of:

The Terrarium, Audubon Nature Bulletin
National Audubon Society. See the Bibliography in the Appendix for the address.

10. Conduct a survey of the kinds of plants, (including trees) wildlife, and insects that can be found on the school grounds. Use a tree identification key, shrub, plant and insect identification keys. Many books dealing with plants and animals, including insects, contain such identification keys.
11. If your school grounds contains an area not covered by concrete, stake out 5' x 5' plots, smaller or larger, if you wish, divide the class into small groups and have each group maintain a daily or weekly record of plant growth, animal activity (including insects), soil temperature, and physical disturbances, such as erosion, within the plot. Interesting comparisons can be made by staking out plots in other areas on the school property. Pick habitats that are different from each other. For example, one area may receive more sunlight than another. If the plots are located on other than well-kept lawns, the children may be permitted to do some shallow digging in order to observe what lies in and under the soil. If the property is covered by concrete, find several cracks in the pavement and keep records of plant, insect and erosion activity in and around the cracks.

12. Explore and compare different plant and animal habitats around the school property. Try to determine the habitat living requirements for different species of plants and animals. Why, for example, are some species of plants found in one area and not in another?
13. Have the class "adopt" a tree located on or near the school property. Observe everything that goes on near or in the tree, including fungus growth, insects living in or on the tree, birds and other animals found in the tree, changes occurring to the tree in the Fall, how it protects itself during its winter "sleep", leaf and flower buds preparing to open in the Spring, flowers changing to fruit and seeds, etc. Measure new twig growth regularly and keep records. Keep a daily or weekly record of the life of the class's tree throughout the school year.

Consider class adoption of two or more different species of trees and make comparisons, such as: do the buds of one species of tree open up earlier than the buds of another species of tree? Are the same kinds of insects found on different trees? Do some species of birds have a preference for one kind of tree over another?

14. Have the class make a list of man's inventions. Then have the pupils make a list of these same inventions which have been utilized by nature long before man appeared on earth. Ask them to list human inventions that do not exist in nature. They will find this difficult, if not impossible to do. For example: hypodermic needle--hollow fang of the

rattlesnake, sonar--the bat, jet propulsion--the squid, submarine--whale, tank--turtle and armadillo, chemical warfare--skunk, camouflage--chameleon. The list is virtually endless.

15. Construct simple insect cages, place an inch or more of soil on the bottom of the cages, and have the children collect live insects for observation and study of insect behavior. Collect cocoons of moths and chrysalids of butterflies and keep them in the insect cages until they hatch. Don't remove the cocoon or chrysalis from the attached twig. Sprinkle the cocoons and soil with a little water about once a week or more often if they become dry.

Collect caterpillars (leave them on the branches on which you find them), and feed them daily the leaves from the kind of plant on which you found them. Feeding can be stopped when the caterpillars weave their cocoons or chrysalids. Obtain a copy of, "Conservation for Camp and Classroom", by Robert O. Bale, Burgess Publishing Co., 1966. This book contains a section on activities relating to insects, starting on page 56. It gives helpful hints for building an insect zoo and how to keep the insects alive. Other interesting activities will be found in this book relating to soil, rocks and minerals, plants and animals, many of which can be done in class or just outside the school building.

16. Conduct a study of the mammals, frogs, toads, salamanders and reptiles found in New Jersey. Write to the following for a free checklist of amphibians and reptiles in New Jersey: Extension Specialist In Forestry

College of Agriculture, Rutgers-The State University, New Brunswick, New Jersey. Request leaflet # 322. Write to the State Department of Fish and Game, Trenton, New Jersey for a list of New Jersey mammals.

- a. Determine where the various animals live.
- b. What do they eat?
- c. Do they hibernate?
- d. Do they serve an important economic use to man?
- e. Are they destructive?
- f. Method of attacking and defending themselves.
- g. Gestation period
- h. Usual number of young
- i. Care and training of young

17. Write to the Extension Specialist in Forestry at Rutgers University (see address above) and request the following leaflets: "Building An Outdoor Classroom for Your School", Leaflet #401., "Homes for Birds" (mimeo), "Birds and Bird Feeding" (mimeo).

18. Collect superstitions, fables and stories about nature and determine if there is an element of truth to any of them. For example, "Porcupines can throw their quills" (they can't throw them, but some quills may shake loose, if the porcupine shakes its tail, and fall harmlessly to the ground), "Bats get tangled in womens' hair", "Elephants are terrified of mice", "Snakes can hypnotize birds and other small animals", "Owls can't see in daylight".

19. Conduct a study of animal adaptations to their environment. Collect pictures which illustrate protective coloration of animals and animal mimicry. This would make a most interesting and fascinating year-long project for several pupils to undertake. Obtain a copy of the book "Wonders of Animal Disguises", by Margaret Cosgrove, Dodd, Mead & Co., Inc., New York, New York, 1962.
20. Plan and develop a nature trail on the school grounds. In place of posting signs giving information about a particular tree, bush, etc., mark the object with a number. Make up a mimeograph sheet with all the necessary factual information about each item and assign a number to each piece of written information which corresponds with the number placed on the object. This method eliminates the work involved in making a new sign should it be destroyed by vandals. A number, if defaced, can be replaced easily. The Audubon Nature Bulletins contains a publication which gives suggestions for building a nature trail. See the Bibliography in the Appendix.
21. During the winter, study the leaf and bud scars as well as the barks of trees in order to learn how to identify trees without their leaves.
22. Go outside after a heavy rainfall and observe storm damage in the surrounding area. For example, compare soil erosion on a grassy area against erosion on unprotected soil. Make comparisons between channels dug by running water over unprotected soil and the formation of the Grand Canyon. Discuss watersheds and what happens to them if all the trees in a watershed are removed.

23. Cut a few selected buds from trees and bushes in the Spring, and bring them into the classroom to force their development. Observe them daily for noticeable changes before they bloom. Keep cuttings in fresh water. Change water regularly.
24. Make plaster casts of animal tracks and leaf prints. Make a permanent collection and label each track and leaf print.
25. Have children bring to class, in small jars, samples of soil from different areas, e.g. wooded area, near a stream, in a playground, etc. Spread out the soil from each bottle onto a white piece of paper, examine their composition and compare them with samples taken from other areas. Note the difference in size of soil particles taken from different areas as well as differences in composition of soils. This can be more dramatically demonstrated by placing each soil sample in a glass jar filled with water. Allow the soil to settle and then observe the different layers formed. Heavy material, such as gravel, will settle on the bottom. Coarse sand, fine sand, silt and clay will follow in that order. Organic matter (decomposed leaves, wood, insects), will float on top.

For more detailed ideas on follow-up activities in general, refer to the book, "Curriculum Enrichment Outdoors", by John W. Hug and Phyllis J. Wilson, Harper & Row, New York, New York, 1965. This informative book describes many activities which can be carried out in the classroom, on the school grounds, and in the surrounding neighborhood. The outdoor

education activities described not only cover the sciences but the book also offers many suggested activities which can be integrated with language arts, math, social studies, music, arts and crafts and recreation.

SOCIAL STUDIES

1. Plan and design conservation displays dealing with such subjects as: forest fires, water and air pollution, soil erosion and littering parks and highways.
2. Make a study of good and bad conservation practices in your local community. Is the local stream, pond or lake cluttered with trash? Do the local residents help take care of their park? Are there any signs of soil erosion within the community?
3. Write to the New Jersey Department of Conservation in Trenton and request a listing of wildlife and plants that are under State protection.
4. Discuss current conservation problems such as air and water pollution, littering in parks and on highways, forest fires and destruction of the redwood forests for lumber and for highway development.

For current written information about conservation problems, refer to the list of Conservation organizations in the Appendix for places to

write. The National Wildlife Federation, as an example, offers a wealth of material for school use, especially during National Wildlife Week. Write to them for further information. (See address in the Appendix)

5. Conduct a study of conservation projects which could be undertaken on the school grounds. Planting tree seedlings, obtained from the State, might be one possibility. Make a list of such projects and present the class's recommendations to the school principal, including a request for materials and equipment needed. Write away for the leaflet:

"Conservation Plantings Make Homes for Birds"

It can be obtained, free of charge (teacher's copy) from:

Extension Specialist in Forestry
College of Agriculture
Rutgers - The State University
New Brunswick, New Jersey

6. Have the class study the history of their city or town and determine what early industries were developed as a result of the abundance of certain natural resources.
7. How did the local natural resources influence the lives, including culture and traditions, of the Indians and early settlers who lived in the area?
8. Start a special conservation bulletin board for current news clippings, pictures and other written material dealing with conservation.

9. Discuss how the topography of the land and natural resources greatly influenced the history of the United States.
10. Make a survey of the local community's natural resources. Determine if they are being utilized to their best advantage. If not, discuss ways in which they can be of greater benefit to the community. Can any of the natural resources, for example, serve a multiple use?
11. Hold a class discussion on the topic: "How Can I Help Protect Our Natural Resources?" Perhaps such a discussion could lead into class conservation projects undertaken in the local community by the children after school hours.
12. Conduct panel discussions on the importance of natural resources.
13. Conduct a debate on why it is or is not important to protect our wildlife, why it is or is not important to have national parks.

SOURCES
OF
PUBLICATIONS

In order to better prepare the class for their trip to the Outdoor Education Center, it is suggested that the teacher obtain written material in advance, on subjects to be studied, from the various agencies listed below. In this way, some activities can be started in the classroom and then continued at the Center.

Some agencies listed offer free materials while others may make a slight charge for their pamphlets and similar publications. Books, of course, are more expensive.

The teacher might wish to write to certain agencies requesting a list of their publications, rather than simply asking for everything they have. This way, the teacher and class can pick out from a list only those publications which would be useful to their particular needs.

The children should be encouraged to write to the agencies themselves. Some agencies, however, may not respond to a child's letter. It is suggested, therefore, that a child who writes a letter requesting written material, indicate that the material is for use of the entire class. In addition, the teacher might include a post-script at the bottom of the letter, making a brief comment about the need for the material, and sign his or her name.

NATIONAL PRIVATE ORGANIZATIONS

The Garden Club of America: Conservation Committee, 598 Madison Ave., N.Y. . N.Y. 10022

Girl Scouts of the United States of America: 130 3rd Ave., N.Y., N.Y. 10022

Izaak Walton League of America: 1326 Waukegan Road, Glenview, Ill. 60025. A membership organization with local chapters; also direct national memberships. Promotes conservation and enjoyment of all natural resources with emphasis on outdoor recreation.

National Association of Soil and Water Conservation Districts: 1435 G. St., N.W., Washington, D.C., 20005. An organization of local soil and water conservation districts.

National Audubon Society: 1130 Fifth Ave., N.Y., N.Y., 10028. A membership organization with local units dedicated to conservation of wildlife and other natural resources.

National Geographic Society: 16th and M. Sts., N.W., Washington 6, D.C.

National Parks Association: 1300 New Hampshire Ave., N.W., Washington, D.C., 20036. A membership organization. Purposes include protection of the national parks and monuments and national forests.

National Wildlife Federation: 1412 Sixteenth St., N.W., Washington, D. C., 20036. A federation of state wildlife and conservation organization; also has direct national memberships. For the wise use of wildlife and other natural resources.

The Nature Conservancy: 2039 K. St., N.W., Washington, D.C., 20006. A membership organization with local units dedicated to the preservation of natural areas for scientific and educational purposes.

Sierra Club: 1950 Mills Tower, San Francisco, California, 94104. A national membership organization with local chapters. "To explore, enjoy, and protect national scenic resources."

Sport Fishing Institute: Bond Building, Washington, D.C., 20005. An industry-supported educational and scientific organization "to improve sport fishing through fish conservation research, education, and service."

The Wilderness Society: 2144 P. St., N.W., Washington, D.C., 20037. A membership organization "to secure the preservation of wilderness."

American Automobile Association: 1712 G. St., N.W., Washington, D.C. 20006. Interests include improved highway billboard controls and scenic highways. Roadside Councils, active in a number of states, may be contacted through the AAA or its state affiliates.

Keep America Beautiful, Inc.: 99 Park Ave., N.Y., N.Y., 10013

Soil Conservation Society of America: 7515 N.E. Ankeny Road, Ankeny, Iowa, 50021.

American Petroleum Institute: Committee on Public Affairs, 1271 Sixth Ave., New York, N.Y., 10020.

American Forestry Association: 919 17th St., N.W., Washington, D.C. 20006.
A membership organization "for advancement of intelligent management and use of forests and related resources."

American Forest Products Industries, Inc.: 1835 K. St., N.W., Washington, D.C. 20006.

American Camping Association: Bradford Woods, Bloomington, Indiana.

American Nature Association: 1214 16th St., N.W., Washington 6, D.C.

Bituminous Coal Institute: 1425 H. Street, N.W., Washington, D. C.

Boy Scouts of America: National Council, New Brunswick, New Jersey 08902.

Camp Fire Girls, Inc.: National Public Relations Division, 65 Worth Street, N.Y., N.Y. 10017.

Conservation Education Association: Selected references on conservation education for teachers and pupils. 15¢. Billings, Montana.

The Conservation Foundation: 30 East 40th St., N.Y., N.Y. 10016.

Wildlife Management Institute: 709 Wire Building, Washington, D. C. 20005.
An educational organization supported by manufacturers of sporting and ammunition to promote better use of natural resources.

Water Pollution Control Federation: 3900 Wisconsin Ave., Washington, D.C. 20016.

FEDERAL AGENCIES

The Soil Conservation Service: Department of Agriculture, Washington, D. C. 20250.

Bureau of Sport Fisheries and Wildlife: U.S. Department of the Interior, Washington, D.C. 20240.

Superintendent of Documents: Government Printing Office, Washington, D.C. 20402.
Has lists of all Federal Government publications. Request lists of publications relating to natural resources.

The Forest Service: U.S. Department of Agriculture, Washington, D.C. 20250

LOCAL AGENCIES

State Museum: Department of Education, P.O. Box 1868, Trenton, N.J.

U.S. Fish And Wildlife Service: Short Course Building, N.J. College of Agriculture, New Brunswick, New Jersey 08903.

The New Jersey Historical Society: 230 Broadway, Newark 4, New Jersey

Union County Agricultural Extension Service: 7 Bridge Street, Elizabeth, N.J. 07201.

The Union County Park Commission: Box 275 Elizabeth, New Jersey 07208

N.J. State Bureau of Forestry: P.O. Box 1889, Trenton, New Jersey 08625.

N.J. College of Agriculture and Experiment Station: Bulletin Clerk, New Brunswick, N.J. 08903.

Somerset-Union State Conservation Department: 1151 U. S. Rt 202, Somerville, New Jersey 08876.

N.J. Division of Fish and Game: P.O. Box 1809, Trenton, New Jersey 08625.

BIBLIOGRAPHY

(ANNOTATED)

UNION COUNTY OUTDOOR EDUCATION CENTER
2 Glenside Park
Berkeley Heights, New Jersey 07922

BIBLIOGRAPHY (ANNOTATED)

The following list is intended to serve only as a beginning basic library of books dealing with different aspects of outdoor education. There are numerous other books published which relate to this field but the list would be too exhaustive to include here.

REFERENCES FOR TEACHERS

Hammerman, Donald R., and Hammerman, William M., Teaching in the Outdoors. Minneapolis, Minnesota: Burgess Publishing Company, 1964 (\$2.95)

Gives a good description of what outdoor education is all about. The book also gives excellent practical suggestions on how outdoor education activities can be integrated with the total school curriculum.

Gabrielsen, A. M., and Holtzer, Charles, The Role of Outdoor Education. Englewood Cliffs, New Jersey: Library of Education Series, Prentice-Hall, Inc., 1964 (\$3.95)

An attempt is made to explain the philosophy of outdoor education and justification for its inclusion as an integral part of the total school curriculum. Other chapters describe the various kinds of programs different schools throughout the country have developed, problems and solutions concerning leadership, points to consider when developing a school-sponsored outdoor education program, and detailed descriptions of outdoor education activities.

This book would be of particular interest to school administrators who are contemplating the development of a school-sponsored outdoor education program.

Hug, John W. and Wilson, Phyllis J., Curriculum Enrichment Outdoors. New York, New York: Harper and Row, Publishers, 1965

A very informative book, written by two elementary school teachers, which relates detailed outdoor activities with the total school curriculum. Activities are described not only dealing with science outdoors but also math (how to stake out an acre of land, determine the height of a tree, etc.), language arts, (communication through outdoor education experiences), social studies, (conservation of natural resources and other topics), arts and crafts, music and recreation.

Operation New York. Using the Natural Environment of the City As A Curriculum Resource. New York, New York: Board of Education, Bureau of Curriculum Research, Curriculum Center; 130 West 55th Street, New York, 19, New York, 1960

Although this publication was written primarily for New York City teachers, the suggestions and information within its pages can be of tremendous value to teachers in urban schools in New Jersey. The purpose of this publication was to help teachers use the outdoor city environment as a resource for enriching their teaching. It covers areas which can be explored around the school building, the school yard, buildings close by, excavations, sidewalks and city lots. "The interrelationships of living things, including man, with their physical surroundings are understood as boys and girls explore the many 'little environments' which are found within the city." (Excerpt from the preface)

Tomstock, Anna B., Handbook of Nature Study. Ithaca, New York: Cornell University Press, 1939 (\$10.00)

An outstanding classic among general nature activity books. One of the most popular books in its field, it was written by an elementary school teacher for teachers. The book describes nature activities in detail which can be done indoors as well as outdoors.

Hillcourt, William, Field Book of Nature Activities and Conservation. New York, New York: G. P. Putnam's Sons, 1961 (\$4.95)

Another classic among books dealing with general nature activities. Covers all aspects of nature study with countless detailed suggested activities and projects. Highly recommended.

Storer, John H., The Web of Life. New York, New York: Signet Science Library Books, The New American Library, Inc., 1956 (\$.60) paperback

A must for all teachers who desire a better understanding of the interrelationships of plants, animals and man to one another and to their environment. The book, in simple language and great clarity, explains the complex term known as the "Balance of Nature".

Audubon Nature Bulletins. New York, New York: National Audubon Society, 1130 Fifth Avenue

These comprehensive Bulletins cover all phases of nature study and conservation. The Bulletins, measuring 8½" x 11", 4-6 pages long, printed in black on glossy white paper, and attractively illustrated with excellent line drawings and photographs, are non-technical, easy to read and understand. There are 70 Bulletins in the set covering 70 different subjects. Among the titles are: "How to Lead a Field Trip", "How to Build a Nature Trail", "Camouflage in the Animal World", "Trees are History Books", "The Ways of

Wildlife in Winter". The Bulletins not only present factual information but also describe activities in which children can participate, including flannel board activities. Individual Bulletins can be purchased at \$.20 each. The set of 70 Bulletins costs \$10.00. Write to the National Audubon Society for a list of Current Bulletins.

Brown, Vinson, The Amateur Naturalists' Handbook. Boston, Massachusetts: Little Brown & Company, 1948 (\$4.95)

A very fine book for teachers who want a good general introduction to natural history. It begins by assuming that the reader is a beginner and progressively delves deeper into many areas of natural history. It covers such subjects as: animal classification, how to collect animals, how to care for them, how to read the stories in rocks, how to recognize, classify and preserve plants.

Brown, Vinson, How to Make A Home Nature Museum. Boston, Massachusetts: Little Brown & Company, 1954

The teacher looking for practical ideas on starting a small nature museum in the classroom will find that this book contains a wealth of information.

Bale, Robert O., Conservation for Camp and Classroom. Minneapolis, Minnesota: Burgess Publishing-Co., 1962 (\$3.00)

Contains many useful but simple activities, demonstrations and experiments, covering not only conservation but all aspects of nature study.

_____. 1,001 Questions Answered About ----- New York, New York: Dodd, Mead & Company (\$6.00 - \$6.50)

An excellent series of books, each dealing with a specific science subject. The books will answer almost any question a child might ask about a particular subject. The books ask questions and then give detailed answers. The questions are arranged by subject area (for example, in the book about Birds, there are a series of questions about bird eggs), and, together with the detailed index, a specific question to which the reader wants an answer can be found quickly.

Following are a selection of books in the series:

1,001 Questions Answered About:

Flowers, The Weather, Trees, The Seashore, Insects,
Earth Science, Astronomy, The Mineral Kingdom, Birds

Coon, Nelson, Using Wayside Plants. New York, New York: Hearthsides Press, Inc., 1960

A fascinating book which describes the ways in which common wild plants can be used ---not only as a source of food, but for making dyes, medicinal purposes, etc. Many plants, familiar to children, are described.

Grimm, William Carey, The Book of Trees. Harrisburg, Pennsylvania: Stackpole Books, 1962 (\$10.00)

An outstanding reference book with excellent line drawings of leaves, buds, fruit, flowers and twigs of trees (drawings are more useful than photographs for the latter are not as detailed). The book also contains interesting information about each tree, such as its economic uses. It also contains summer and winter tree keys for identification purposes.

Lentz, Austin N., Common Forest Trees of New Jersey. New Brunswick, New Jersey: Extension Service, College of Agriculture, Rutgers - The State University (\$.75)

This well-done publication includes the most common forest trees found in New Jersey, as well as a few of the more common shrubs found in the State. Identification of trees is simplified by comparing the leaf, twig, flower or fruit with the excellent large, clear, line drawings. The text includes information on the economic uses of each tree or shrub. Highly recommended.

Lentz, Austin N. and Calderon, Donald S., The Story of New Jersey Forests in Nine Easy Lessons. Cooperative Extension Service, College of Agriculture and Environmental Science, Rutgers - The State University, New Brunswick, New Jersey

" . . . designed to help children . . . understand the importance of New Jersey forest resources. Boys and girls who complete the course will have a keen appreciation of trees in general and a worthwhile comprehension of the influence of forests on their environment."

This fine publication, in addition to relating interesting information about New Jersey forests, also offers suggested activities for each topic discussed, as well as a list of references for more detailed sources of information. The publication is free to teachers and costs \$.10 per copy for pupils when ordered in quantity.

Mathews, F. Schuyler, Field Book of American Trees and Shrubs. New York, New York: G. P. Putnam's Sons, 1915 (\$3.95)

An excellent field guide containing lined drawings provides interesting information about each tree and shrub.

Rockcastle, Verne, N., Keeping Animals in the Classroom. Cornell Science Leaflet, Ithaca, New York: Cornell University, 1959, Volume 53, Number 1 (\$.25)

Describes how small animals can be kept healthy and vigorous in the classroom.

The Cornell Science Leaflets would be a fine addition to the school or classroom library. The booklets, usually over 25 pages in length, are written primarily for the elementary school teacher and cover all areas of science. Write to: Cornell Science Leaflet, Stone Hall, Cornell University, Ithaca, New York for a current list of back issues. A subscription for one year, which includes four leaflets, costs \$1.00.

Robbins, Chandler S., Brunn, Bertel, and Zim, Herbert S., A Guide to Field Identification - Birds of North America. New York, New York: Golden Press, 1966 (\$2.95 soft cover, \$4.95 hard cover)

An excellent field guide which can help teachers and students learn to identify birds attracted to bird feeders placed right outside classroom windows. All pictures of birds in the guide are painted in their natural colors to aid in identification.

Schneider, Herman, Everyday Weather and How It Works. New York, New York: Whittlesey House, 1951

An easily understood approach to the factors which cause changes in the weather. The book presents suggested activities for weather study and describes how to make simple weather instruments from easy-to-find household materials.

A LIST OF ORGANIZATIONS PROVIDING FREE LITERATURE

American Forest Products Industries, Inc.
1816 N. Street, N. W.
Washington, D. C. 20036

Write for their booklet, Teaching Aids, which lists the free publications available for use in the classroom. Included in the list are booklets and colored charts, suitable for hanging, which describe many aspects of Forestry.

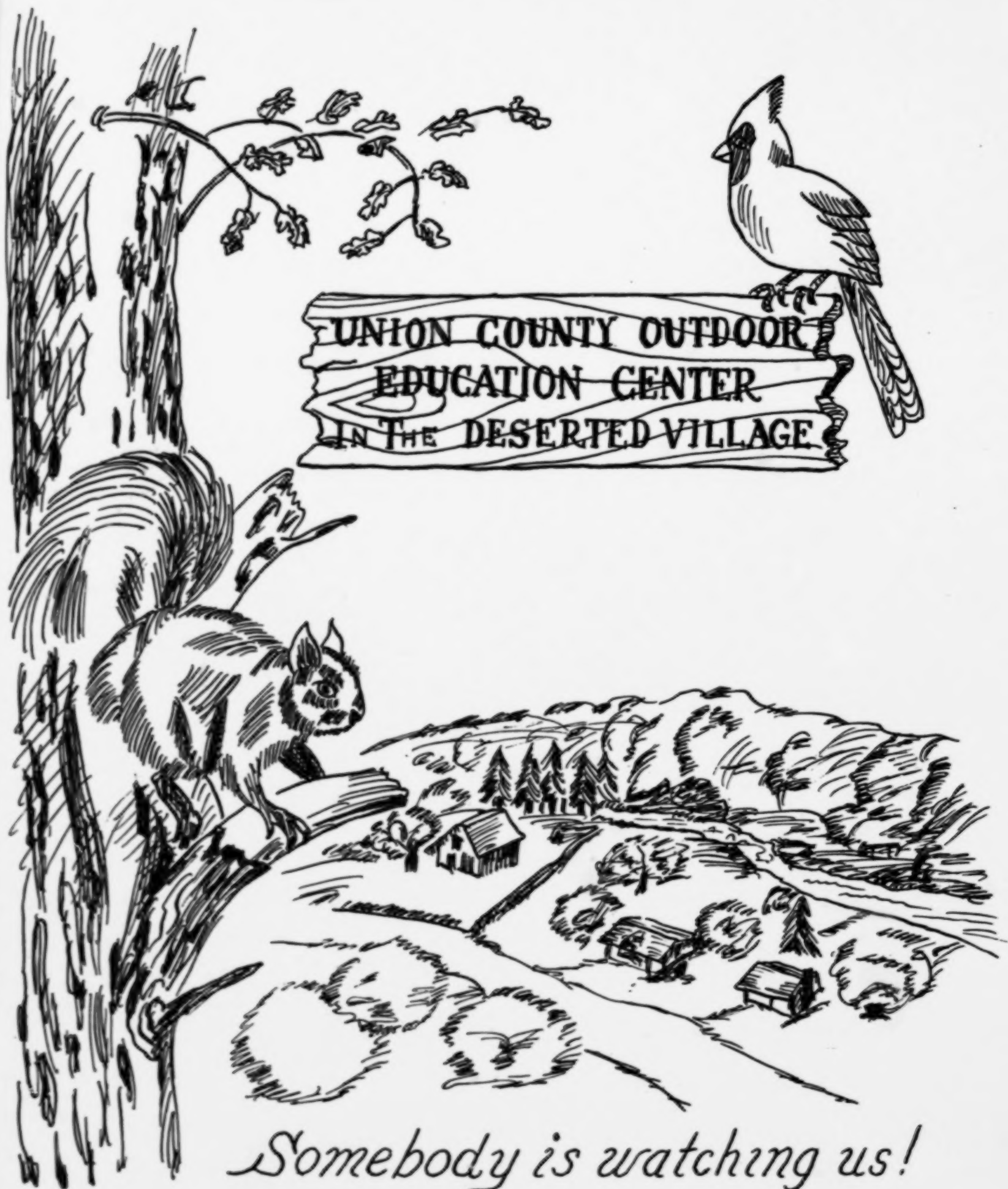
Cooperative Extension Service, College of Agriculture and Environmental Science
Rutgers - The State University, New Brunswick, New Jersey

Request their Catalog of Forestry Aids

Write to the following Federal Government Agencies for their "List of Publications":

Forest Service, U.S. Department of Agriculture, Washington 25, D. C.
Soil Conservation Service, U.S. Department of Agriculture, Washington 25, D.C.
Fish and Wildlife Service, U.S. Department of the Interior, Washington 25, D.C.
National Park Service, U.S. Department of the Interior, Washington 25, D.C.

For a more complete listing of Conservation organizations which offer free and inexpensive materials dealing with all aspects of conservation, see Sources of Publications in the Appendix of this Teacher's Guide.



Somebody is watching us!

PACE~ PROJECTS TO ADVANCE CREATIVITY IN EDUCATION

January 1968

The Union County Outdoor Education Center, funded by the Federal Government under Title III of the Elementary and Secondary Education Act, Public Law 89-10, is administered by the Linden Board of Education, Linden, New Jersey. The Outdoor Education Center's program and facilities, however, are available to all school districts within Union County.

* * * * *

LOCATION OF THE OUTDOOR EDUCATION DAY CENTER

The day center outdoor school is located in the Watchung Reservation, a 2,000 acre wooded park located in the Watchung Mountains. The Union County Park Commission has generously permitted the Union County Outdoor Education Center to locate its program in the Reservation.

Here there are trails once followed by the Indian, and sites where he once settled. There is an abundance of wildlife such as deer, squirrels, chipmunks, weasels, mink, muskrats, raccoons, fox, ducks, and other waterfowl. There are hills, fields, lakes, ponds, brooks, woodlands, and a Natural History Museum and Trailside Nature Center. Most of the Reservation is being allowed to remain in a natural, undeveloped state.

The Outdoor Education Center is located in an area of the Watchung Reservation known as Glenside Park. Its more popular name, however, is Deserted Village. (See map on back cover.)

The village is steeped in history. Brief fighting broke out here between scouting parties from the British and Revolutionary forces. Grist, or flour mills, utilizing water power, served generations of settlers who lived here. The grist mills became powder mills during the War of 1812 and later became paper mills. A sizable village had grown up here during that time, and ten of the buildings are still standing today.

One of the buildings serves as the Administration Office and Library for the Outdoor Education Center. Other buildings are used for a Field Science Laboratory, Nature Center, Arts and Crafts Room, a Museum and Meeting Rooms. One hundred pupils can be accommodated each day.

* * * * *

LOCATION OF THE OUTDOOR EDUCATION RESIDENT CENTER

The Resident Outdoor School is conducted at Camp Minisink, a Y.M.C.A. complete camp facility, located on a 500 acre site in Sussex County near Stillwater, New Jersey. (See map.)

The Camp provides excellent all-weather facilities and can accommodate a total of 180 students and staff. It is approximately 60 miles from all of the Project's participating schools.

THE OUTDOOR EDUCATION STAFF

The full-time staff consists of the Director of the Program and an Assistant Director. Additional part-time teaching staff are employed on a day-to-day basis. The part-time instructors are all knowledgeable in their respective fields.

ARTHUR J. RYAN

The Present Director of the Union County Outdoor Education Center, is a certified teacher in Science at the secondary school level. He has had a wide range of experiences related to the outdoors, including field work with the New York State Conservation Commission (exploring remote ponds and lakes to locate spawning beds of trout, clearing trails, tree cutting and fire fighting); Camping Director for Boy Scouts, Director of a summer camp, and Program Director of a Y.M.C.A. summer camp. He has hunted, fished, and camped extensively for many years, both summer and winter, in remote areas of the Adirondacks.

JAMES M. KENNY, JR.

Assistant Director of the Outdoor Education Center (December, 1966 - July, 1967) is presently on a leave of absence in order to participate in a graduate program on Outdoor Education. He earned his B.S. in Elementary Education from Wagner College. He has had general and science teaching experience in grades five through eight. He has served the scouting movement in scout and explorer programs on both advisory and institutional organization levels.

UNION COUNTY OUTDOOR EDUCATION CENTER

DAY CENTER

The program at the day center provides one and two day sessions for fifth and sixth grade students from all public and non-profit private schools in Union County. When the Resident Center is fully established, the Day Center will concentrate on fifth grades while sixth grades will participate only in the Resident Program.

Classes arrive at the Day Center by bus at 9:30 a.m. and remain until at least 2:30 p.m. Each class is accompanied by the class teacher and one other school staff member or parent. Teachers have classes divided into groups of 12 to 15 students and each group is assigned to an Activity Leader. All groups participate in two activities a day. (See Activity descriptions.)

RESIDENT CENTER

A pilot Resident Program was conducted in the Fall of 1967 at Camp Minisink. This program will be continued on an operational basis in 1968. Classes spend two and one-half days at the Camp where they participate in a wide range of activities which endeavor to achieve the following objectives:

Appreciation of natural resources

Development of lifetime leisure skills

Development of social skills and
social adaptation

Development of self-reliance and independence
from influence of family and urban life

HISTORY OF GLENSIDE PARK (DESERTED VILLAGE)

PERIOD I

Unknown duration. Inhabited by beavers; dam put across Blue Brook and pond formed. Abundance of wildlife.

PERIOD II

Unknown duration. Inhabited by American Indians, (Lenni Lenappi tribe or Delawares), in winter only. Mountains called Watchung ("High Hills"). Indian Spring present, also called Sulphur Spring or Sulphur Magnesia Spring, "the all-healing spring"; Salt Brook present (salt secured in the winter of 1779-1780 by Washington's troops). Indian Village was built on the plateau; Indians spent the warm part of year fishing in Raritan Bay and Staten Island.

PERIOD III - (1664-1736) - 72 years

Land sold by Chief Warinaco and Chief Mattano to the Elizabethtown Associates. It was not claimed for 72 years. Delaware Indians still lived here.

PERIOD IV - (1736-1845) - 109 years

Peter Willcox (Willcoxie) bought 424 acres. He came from England via Long Island. John Badgley bought adjacent land where Trailside Museum is now located. Willcox built a house, saw mill and grist mill, planted a fruit orchard, built a dam and a mill race. Machinery was transported by ox cart from Elizabethtown. A copper mine was in operation. Settlers arrived in the area from England, Scotland, Wales, Long Island. They grew grain which was then taken to the mill to make flour. The roads were called mill roads. The area was called "Peter's Hill". A third mill was built which in The American Revolution (1776-1780) became a powder mill as well as in the war of 1812. This led to a battle at Springfield and Scotch Plains.

PERIOD V - (1845-1860) - 15 years

760 acres was bought by David Felt, printer and stationer from New York City. He was called "King David". He rebuilt the dam and the three mills, imported new machinery for papermaking and book-binding, produced blank books and built a dye-house for marbelizing paper. The isolation, poor roads and long work hours made necessary the development of a village. It was called Feltville, and had a population of 300 to 400 people, 26 buildings (mansion, summerhouse, barn, 13 double cottages, two boardinghouses, school house, church-store, storehouse, dye-house, 3 mills and a blacksmith shop). A U.S. Post Office was located in the store. The postmark bore the name "Feltville". The books printed here

were inscribed, "Stationer's Hall Press, Feltville". "Littell's Genealogy" is the only book printed here which is still in existence. Supplies were secured from Elizabeth and New York by blue and red Conestoga wagons. Business was conducted mostly with the South. Feltville closed up with the outbreak of the Civil War (1861-1865).

PERIOD VI - (1860-1864) - 4 years

The village was bought by Mr. Amasa Foster. The population began to drift away.

PERIOD VII - (1864-1882) - 18 years

The village was bought by Dr. Samuel Townsend, "The Sarsaparilla King", the original "Dr. Jacob". The mills didn't adapt successfully to sarsaparilla and so they closed. The workmen moved away and the store, church and school closed. Peach and apple orchards were laid out and tobacco planted. Negro workers were imported. The upper mill was turned into a dormitory for them. The lower mill became a curing barn for tobacco and the store was converted into a cigar factory. Cuban cigar makers were imported from New York City. The Ailanthus silk moth and the Ailanthus tree were imported. These activities eventually died out and the area became known as "Deserted Village", between 1880-1882; an actual ghost town.

PERIOD VIII - (1882-1919) - 37 years

744 acres were bought by Warren Ackerman for \$11,450. He imported stock and oxen. The lower mill became the barn for stock. The present barn where the children eat lunch was built in 1885. Summer boarders were taken in. A steeple was added to the church, a fire alarm erected, a pump house built, a fence and gate erected. The area was called "Glenside Park". The sister of Cecil B. DeMille (the famous movie director) was a resident. Floods after the blizzard of 1888 washed out the dams.

PERIOD IX - (1915-1929) - 14 years

The village was completely deserted.

PERIOD X - 1930

The village was bought by the Union County Park Commission.

1967

The Union County Outdoor Education Center was established.

This condensed history of Glenside Park was prepared by the staff of the Trailside Museum and Nature Center in the Watchung Reservation. The major sources used for the condensation was the publication, THE DESERTED VILLAGE, by Dr. Arthur L. Johnson and the revised publication of the same name, by James. B. Hawley.

BOTANY
Our Natural Resources



The objective of this activity is to teach the children the importance of conservation of natural resources to mankind. Recognition of the fact that maintenance of suitable habitats for the continuance of wildlife is also stressed. It is hoped that the development of a deep and sincere attachment to the outdoors through understanding and knowledge of plant life and its significance in our daily life will be nurtured.

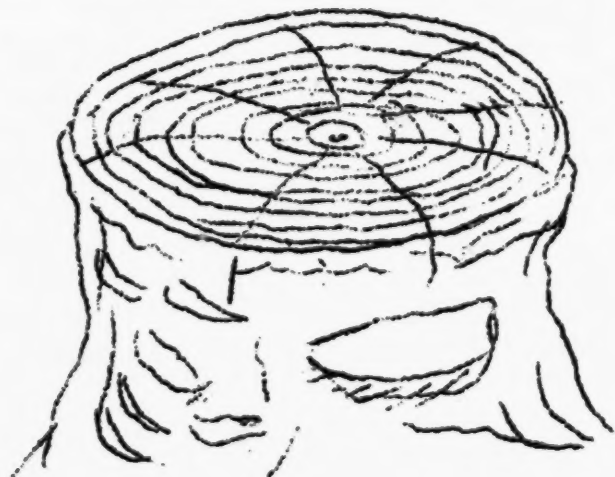
This activity tries to cover as much of the area as possible in the time allotted to observe and study representative tree, plant, soil, and water specimens.

A sawed-off tree is examined to ascertain the age and life cycle of the tree. The life cycle of insects is discussed using caterpillar and butterfly comparisons. A rotting log study brings in the termite and fungal activities as well as the importance of decaying wood to plant life.

Soil texture in different growing areas is examined and the differences noted. Natural spring and water tables and over-all importance to mankind are discussed.

Trees and plants are identified while studying bark, leaves, etc. All five senses are stimulated in this nature study.

At the end of the trip, highlights of the activity are reviewed.



ECOLOGY AND GEOLOGY

The objective of this activity is to stimulate a keener interest in and an appreciation of nature by relating nature in its various forms to the needs of human life. An enjoyable experience in a natural setting is provided.

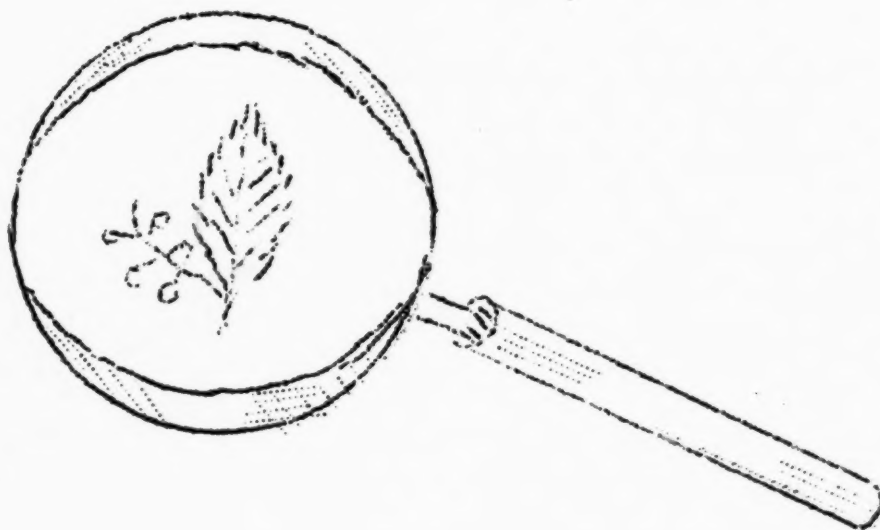
The purpose of the reservation is discussed in relation to available foods both natural and cultivated. Many of the natural foods are still available along the trail. Plants used for medicinal purposes are pointed out and discussed.

Large conglomerate rocks are examined and discussed in relation to glaciers and ecological progression following the glacier.

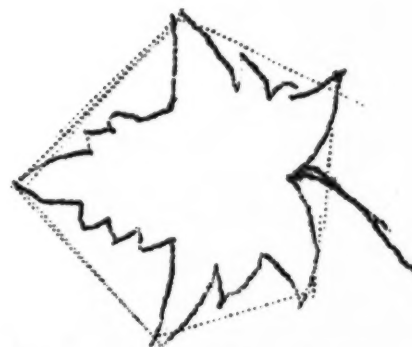
Sandstone outcropping is noted and related to its formation and eventual erosion.

The brook is followed and its function in the formation of the valley is discussed. The alterations in its course are pointed out and the importance of this is discussed.

After the trip, a brief review and a question and answer period is held.



FIELD MATH



Outdoor math is an extension of mathematics from the classroom to nature itself. The student is more apt to understand certain concepts when transferred to real situations. Indeed, the relaxed atmosphere alone sometimes is enough to release a child's reluctance to participate.

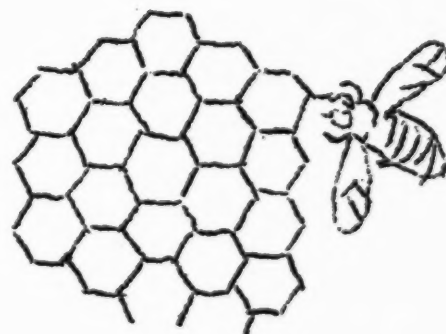
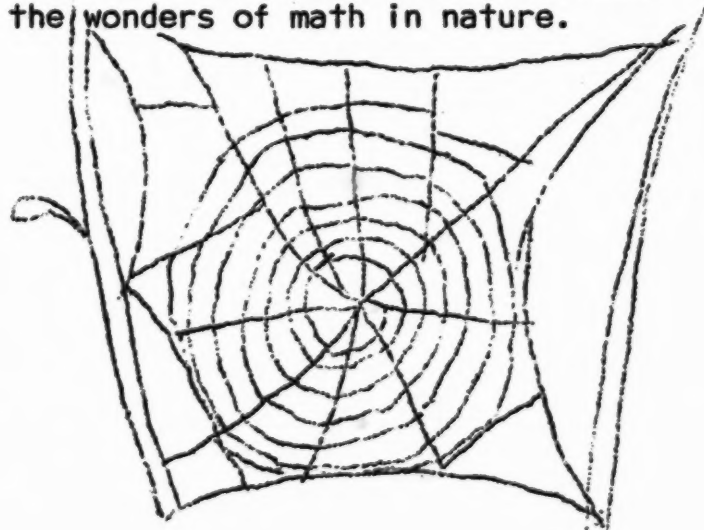
The activity begins in a selected open area in the woods. Each pupil and the teacher learns the compass through discussion and its application to a geological map of the area. After plotting and following a compass course to a selected landmark and how to return, the class is divided into two groups of boys and girls. Each group is given a compass course to follow on his own. The completion of the course results in encompassing an acre of land which is discussed and computed in square feet and its relationship to the entire project area. Later, the pupils are diverted into a heavily wooded area to determine a compass course back to their starting landmark. Interestingly, girls frequently make the best diagnosis.

On the trail students are acquainted with the many facets of math in nature such as degree rotation of leaves and limbs, shapes of leaves and conifer cones, spider webs and flower designs.

The old lumber scaler's technique of determining a tree's height by use of a three foot stick is demonstrated as well as determining a tree's diameter and number of board feet of useful lumber in a tree.

Pupils insist on proving the error of such simplicity and soon learn the applicable value of math outdoors.

Finally, they are encouraged to plan a family camping trip to demonstrate their new-found knowledge of a simple compass and the wonders of math in nature.



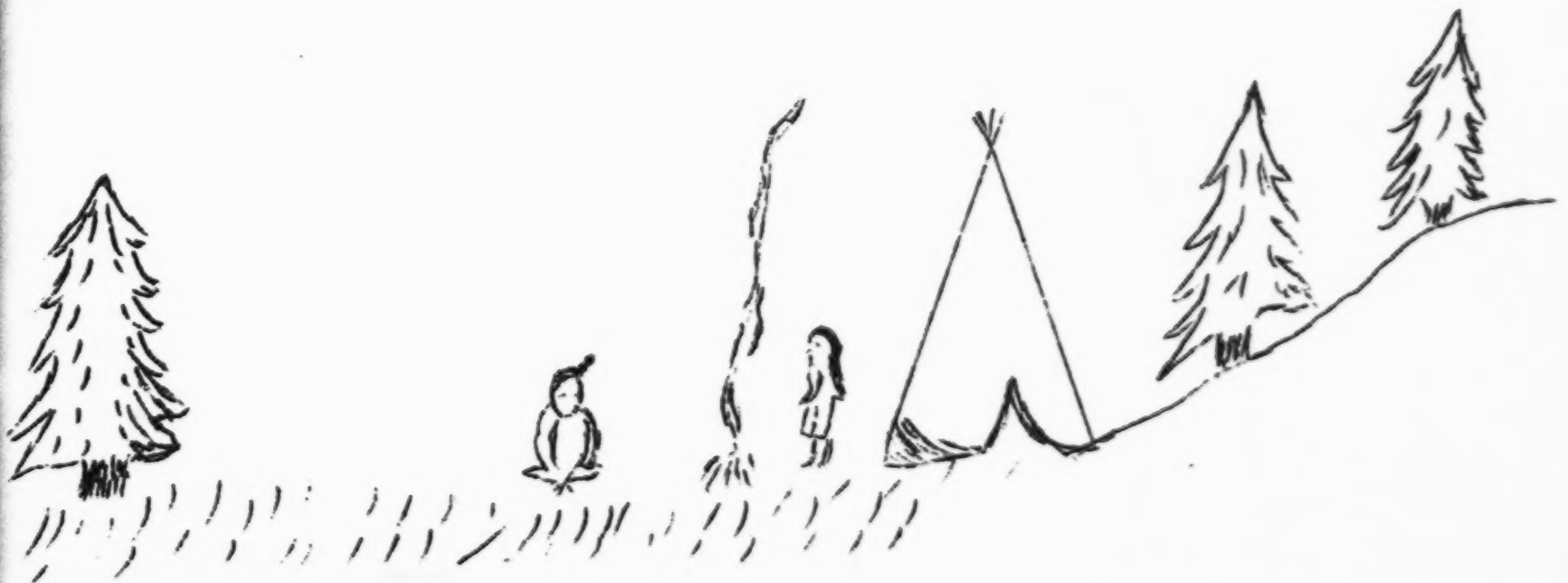
HISTORY OF THE VILLAGE

Under the leadership of a historian who has resided in the Deserted Village for thirty-five years, a very interesting study is made of the history of the area relating back to the time when it was inhabited by the Lenni-Lenappi Indians.

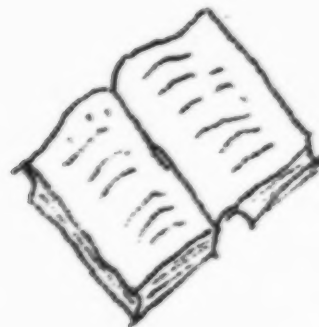
A tour is made of the Village with the examination of the existing buildings which are over 120 years old. It is pointed out how the people lived then as compared to the conveniences which are enjoyed by people today.

The site of an old earthen dam is examined and visually reconstructed in relation to the foundation. By means of a rope, the height of the dam is shown and in turn the extent of the lake as it previously existed.

The bed of the sluiceway is followed to a remaining wall of the old mill to describe the source of power and the activities of the mill. Leading questions elicit interesting answers and responses from the pupils on the difficulties overcome by the early settlers and finally how Mother Nature has practically reclaimed the land.



LANGUAGE ARTS
Creative Expression



Using the quiet and calm of the outdoors to relax the children an attempt is made to stimulate the children to use their best creative abilities.

A "warm-up" hike is taken where the children are made aware of the color, texture, shape, etc. of the things seen in nature. Sounds and smells are described as they walk along the trail.

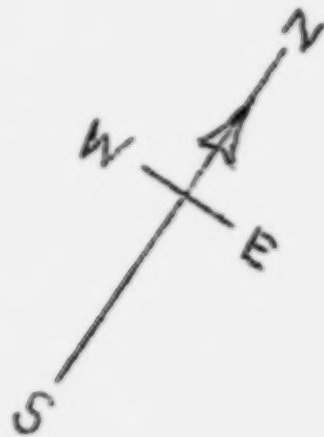
They proceed to an area where the background is beautiful and quiet. Excerpts from nature poetry written by Emerson, Frost, Thoreau, etc., are read and discussed briefly. The children are then instructed to put in their own words, either in poetry or prose, the impressions they have received from their exposure to nature.

The classroom teacher has been consulted previously as to the class training in language arts and the general academic level of the group. Her preference as to the type of creative expression desired is relayed to the children.

Copies of the best work done by the children in this activity are made for the program's records. All written work is returned to the teacher before they leave.



ORIENTEERING AND COMPASS
Using the Compass



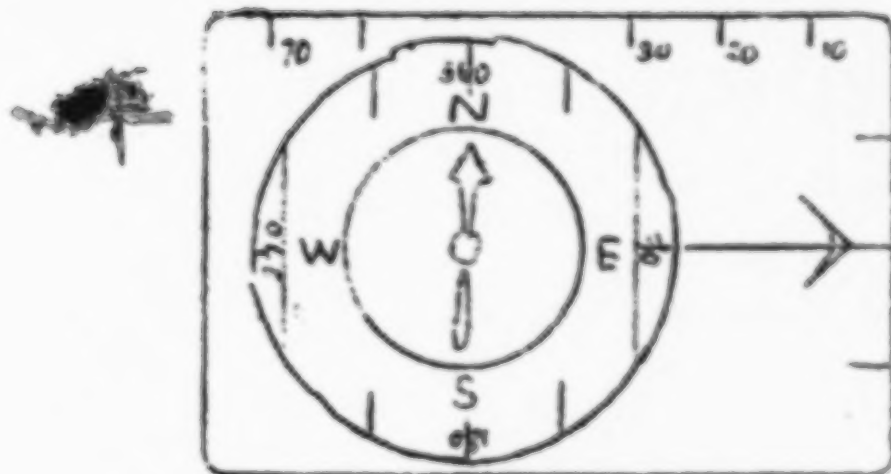
The objective of the Orienteering and Compass activity is to teach all the students what a compass is, what it does, and how to use it.

The students and the teacher are each given a compass and are taken outdoors away from the buildings in order to be in the forest area. This is where a compass is most generally needed and used. A small open area where all can sit or stand in a circle is chosen.

Questions are asked, such as "what does a compass do?" and "what is it used for?" The construction of the compass is discussed, the orienting of a compass, and the difference between "true" and "magnetic" north are explained.

Charts are used and the setting of a compass is practiced until everyone can set it quickly. Games are also played which involve the use of the compass. An effort is made to tie in compass work with the children's everyday interests.

At the conclusion of the trip, the use of the compass is reviewed and a compass crossword puzzle is given to each child to be used as a follow-up in the classroom.



ORINTHOLOGY AND BOTANY
Birds and Plant Life



Birding amply satisfies our curiosity about all animal life. The joys of discovery and the aesthetic appeal of avian species provides rewarding experiences for the observer. The study of birds is one of the few fields in biological science where the contribution of the "amateur" is still important.

The children are instructed in the proper use of binoculars. They then proceed to the bird-feeder and are allowed to observe the birds and acquire a feel for the binoculars.

A brief discussion is held on the different types of food that birds eat (seeds, berries, insects, etc.) and where they may find them.

The varied construction of bird nests is shown as well as some of the materials used in nest building.

The different characteristics of birds are noted such as their walk, hop, tail wagging, walking down a tree head-first, backing down tail first, etc.

Using a Bird Guide, the children attempt to identify different birds to see how many species they see. A list is prepared showing the birds they have seen.

After the trail trip, the highlights of the trip are reviewed and a discussion held on what they might do as a follow-up program in school.

This activity, just as in all other activities in the program, strives to make "learning" enjoyable.



SURVIVAL IN THE WOODS



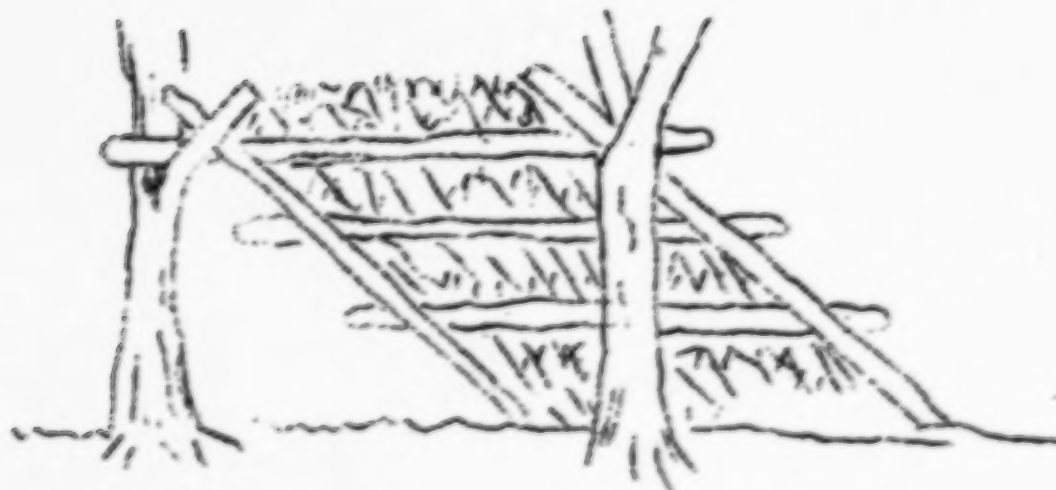
The objective of this activity is to help a child while exploring the woods, or camping, to recognize the precautions necessary and the skills required for survival in the woods. Along with the knowledge of the necessary skills comes a broader and deeper appreciation of nature.

Children participate in the many aspects of first aid, shelter building, fire building, identification of poisonous snakes, plants, etc.

A very detailed talk and demonstration are given using the edible wild foods which are indigenous to this particular area.

Much of the knowledge acquired here is used by the families of the children who come later on a nature trip to this area. The children, themselves, conduct this "family" outing.

This activity helps to instill in the child a realization of his relationship to the natural world around him.



WOODLAND CRAFTS

When engaging in art activities in the outdoors, one develops a keener sense of observation and appreciation of art and beauty as it is found in nature.

Each student collects interesting natural objects from the woods such as dried seeds, bark, dead twisted vines, and small rocks. All of these items can be used in an artistic arrangement using native clay as a base. Other activities such as sand casting, mobiles, leaf prints, and the drawing and painting of things as seen in nature are also conducted.

Probably the most significant phase of this activity is to stress nature while allowing the child's imagination free rein.

The children are allowed to take with them any of the projects they complete at the Center.

That children will obtain an appreciation of beauty through "guided seeing" is this activity's greatest objective.



DAY CENTER PROGRAM SCHEDULE

DATE _____ DAY _____

SCHOOL	TOWN
--------	------

SUPERVISOR TELEPHONE NO.

[illegible]

GRADE	NO. STUDENTS	NO. GROUPS
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Class 1 _____ Teacher _____

[illegible]

ANIMALS OF THE WATCHUNG RESERVATION



Red + Grey Squirrel



Chipmunk



Weasel



Skunk



White-tail
Deer



Raccoon



Woodchuck



Cottontail Rabbit



Field Mouse



Muskrat



Fox

UNION COUNTY OUTDOOR EDUCATION CENTER

Trees of the Watchung Reservation

<u>DECIDUOUS TREES</u>	<u>IDENTIFIED AT CENTER</u>	<u>DECIDUOUS TREES</u>	<u>IDENTIFIED AT CENTER</u>
Sugar Maple		Black Walnut	
Red Maple		Tree of Heaven	
American Beech		Northern Catalpa	
Black Birch		Basswood	
Grey Birch		Shagbark hickory	
White Oak			
Black Oak			
Red Oak			
Chestnut Oak		<u>EVERGREEN TREES</u>	<u>IDENTIFIED AT CENTER</u>
Pinn Oak		Red Pine	
Tulip		Pitch Pine	
Red Hickory		Scotch Pine	
Sassafras		White Pine	
Ironwood		Red Cedar	
Black Cherry		Norway Spruce	
Sweet Cherry		Douglas Fir	
Poplar		Eastern Hemlock	
Black Gum			
Sweet Gum			
Sycamore			
Flowering Dogwood			
Elm			
Osage Orange			

UNION COUNTY OUTDOOR EDUCATION CENTER
Berkeley Heights, New Jersey

Birds Observed at the Watchung Reservation

TYPE OF BIRD	NAME OF BIRD	RESIDENT	TRANSIENT	DATE SEEN
Water Birds	Mallard Duck	*	**	
	Black Duck	x	**	
	Wood Duck	*	**	
	Pie Billed Grebe	x	**	
	Canada Goose	*	**	
	Herring Gull	*		
	Kingfisher	x	**	
Wading Birds	Great Blue Heron		**	
	Little Green Heron		**	
	Snipe		**	
	Solitary Sandpiper		**	
Open Field Birds	Woodcock	*		
	Pheasant	*		
	Meadowlark		**	
	Bob White	*		
	Mourning Dove	*		
	Crow	*		
	Mockingbird	*		
	Robin	x	**	
	Starling	*		
	Kingbird (Eastern)		**	
	Tree Swallow		**	
	Rough Wing Swallow		**	
	Barn Swallow		**	
	Indigo Bunting		**	
	Yellow Breasted Chat		**	
	Blackbird (Red Wing)	x	**	
	Cowbird (Brown Headed)	*	**	
	Goldfinch	*		
	Bluebird	x	**	

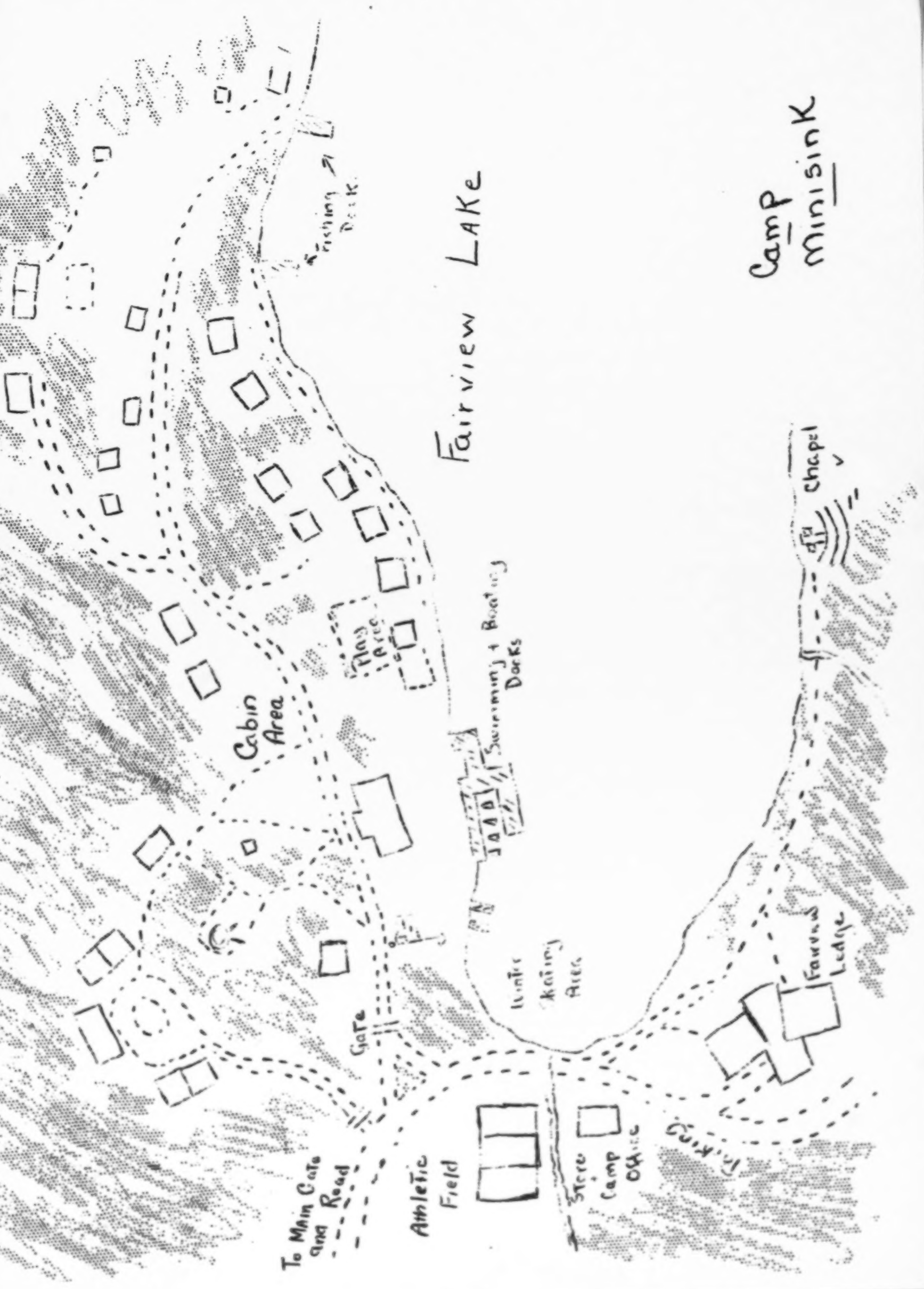
TYPE OF BIRD	NAME OF BIRD	RESIDENT	TRANSIENT	DATE SEEN
Forest Birds	Flicker	*		
	Downy Woodpecker	*		
	Hairy Woodpecker	*		
	Verry Thrush		**	
	Northern Water Thrush		**	
	Hermit Thrush	x	**	
	Wood Thrush		**	
	Swainsons Thrush		**	
	Blue Jay	*		
	Chickadee (black capped)	*		
	Titmouse (tufted)	*		
	Nuthatch (white breasted)	*	**	
	Nuthatch (red breasted)	x	**	
	Brown Creeper	*	**	
	Cedar Waxwing	*	**	
	Yellow Bellied Sapsucker	*		
	Rosebreasted Grosbeak		**	
	Scarlet Tanager		**	
	Yellow Billed Cuckoo		**	
	Black Billed Cuckoo		**	
	Alder Flycatcher		**	
	Crested Flycatcher		**	
	Solitary Vireo		**	
	Red Eyed Vireo		**	
	Pine Siskin	x	**	
	Pine Grosbeak	x	**	
	Blackbird (rusty)	x	**	
	Grackle (common)	x		
	Towhee (rufous-sided)	x	**	
	Catbird		**	
	Wren (house)		**	
	Winter Wren	*	**	
	Cardinal	*		
	Purple Finch	*	**	
	Junco (slate colored)	*	**	
	Brown Thrasher	x	**	

TYPE OF BIRD	NAME OF BIRD	RESIDENT	TRANSIENT	DATE SEEN
Birds of Prey	Sparrow Hawk	*	**	
	Red Tail Hawk	x	**	
	Broad Wing Hawk	x	**	
	Ruffed Grouse	*		
	Great Horned Owl	*		
Warblers	Kinglet (golden crowned)	*	**	
	Kinglet (ruby crowned)	*	**	
	Myrtle Warbler	*	**	
	Palm Warbler		**	
	Black & White Warbler		**	
	Chestnut Sided Warbler		**	
	Yellow Throated Warbler		**	
	Black Throated Green "		**	
	American Redstart		**	
	Yellow Warbler		**	
	Blue Winged Warbler		**	
	Worm Eating Warbler		**	
	Prairie Warbler		**	
	Cape May Warbler		**	
	Parula Warbler		**	
	Wilson's Warbler		**	
	Ovenbird		**	
	Golden Winged Warbler		**	
	Purple Finch	*	**	
	House Finch	*	**	
Sparrows	House	*		
	Song	*		
	White Throat	*	**	
	Field	*	**	
	Fox	*	**	
	Tree	*	**	
	Swamp	*	**	
	White Crowned	*	**	
	Savannah		**	

* WINTER RESIDENTx OCCASIONAL WINTER VISITOR

Camp Minisink

Fairview Lake



UNION COUNTY
OUTDOOR EDUCATION CENTER
PROJECT AREA AT
GLENSIDE VILLAGE
COMMONLY CALLED
THE
DESERTED VILLAGE

SCALE
1 in. = 400 ft.
0 100 200 300 400

